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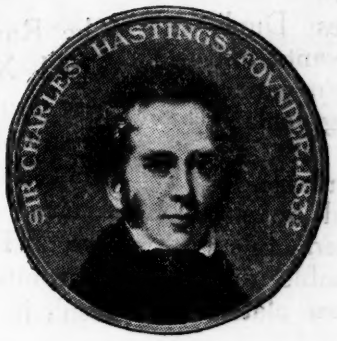

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ON

LIMPS IN CHILDREN:

THEIR RECOGNITION, ORIGIN, AND TREATMENT.

BY

JOHN FRASER, M.D., F.R.C.S.,

SURGEON TO THE ROYAL HOSPITAL FOR SICK CHILDREN; ASSISTANT SURGEON, ROYAL INFIRMARY, EDINBURGH.

PERHAPS I ought to apologize for dealing with a subject which the orthopaedist has come to regard as his own, but I am going to make no apology, because I speak from the point of view of the general surgeon—of one who has to spend much of his time in the wards of a children's hospital, and who is constantly experiencing the practical difficulties of which I speak.

In discussing the subject I shall attempt to illustrate certain distinctive limps by means of cinematograph pictures, a method of illustration which we are finding of increasing value in teaching the student, and also (if I may say so) of humbling the surgeon. The average surgeon is notoriously an optimist—I suppose his work makes him such, for someone has said that where there is no faith there can be no surgery. But, nevertheless, I am afraid that many of our surgical results are seen through rose-coloured spectacles. We forget the original picture, and we take too much credit for our post-operative results. A pre-operation film is an excellent corrective!

The Importance of Recognizing and of Investigating a Limp.

We have all had the experience of being asked to see a child because it is limping, and I know few more difficult problems than that of definitely localizing the site and the origin of the disorder. The younger the patient the more difficult does the problem become. He may be able to give us no assistance, and frequently he is actively antagonistic; the story of the parents may be garbled or actually misleading, and in many cases the elucidation of the mystery depends entirely on the clinical acumen and the trained observation of the examiner.

It is certain that the average parent has no sympathy with the doctor if he is unsuccessful in solving the mystery, or if he makes a mistake in diagnosis. To their minds the problem should present no difficulties, and therefore they make no excuse for error; but, as I have said, and as I shall attempt to show, few more difficult problems come under the notice of the specialist or general practitioner.

It is obviously essential that the origin and nature of the limp should be determined before adequate treatment can be carried out. Purely empirical treatment is rarely successful.

There is yet another reason why one urges the early and thorough investigation of a limp, and, though I mention it last, it is, from the practical point of view, the most important—early recognition and definition spells early treatment, and the pathology of many limps is of such a nature that early treatment means a good result, while delay may entail functional disaster.

A General Consideration of the Possible Causes of a Limp in a Child.

When a limping child is brought to notice and one is asked to furnish the diagnosis, I believe that it is a good plan to consider the problem from a logical standpoint—to say to oneself that there are certain groups into which limps may be classified. It is the first duty of the observer to recognize into which class the case falls. Having decided this more general consideration, it naturally becomes an easier matter to explore the various possibilities of the larger group, and to conclude with a local and exact diagnosis. We shall see the application of my argument in a moment when I have elaborated a scheme of classification.

Classification of Limps from the General Point of View.

This question of the general scheme of classification of limps is by no means as easy as it might appear. As far as I know, the question is not specifically considered from this point of view by either the orthopaedist or the general surgeon, but it seems to me that there are certain general classes of limps, and when a limping child is brought to me for an opinion, the first thing I do is to attempt to put the limp into its general class. What are these general classes? I would venture to suggest that they may be tabulated as follows—and of course there is nothing original about the classification—it is merely common sense:

I. Functional limps.
II. Painful limps.
III. Flaccid limps.
IV. Spastic limps.
V. Mechanical limps.
VI. Stiff limps.

Let me in a few words explain what I mean by these relative terms.

Functional limp is rare in children, especially in the early years of life. If met with, it is generally found in girls over the age of 8 or 9 years. It has certain characteristics of stiffness, of variation in degree and of exaggerated symptoms unaccompanied by any discoverable lesion. It forms a distinctive class of limp, as I shall attempt to show, but its diagnosis must only be made after the careful exclusion of other possibilities.

Painful limp, or the "hurrying limp," as it is sometimes called, has as its essential feature the reduction to a minimum of weight-bearing on the limb. The source of the pain may vary from a blister of the foot-sole to an acute infection of the hip-joint. The degree of limp will be modified according to the situation and degree of the pain.

Flaccid limps. Under this term I include those gaits in which the distinctive feature is muscular weakness, from whatever cause it may proceed, whether the central nervous system, the peripheral nerves, or the muscles. The possible origin may have such varying sources as poliomyelitis, a peripheral nerve lesion, or a muscular dystrophy.

Spastic limps are generally characteristic, and there is rarely any difficulty in their recognition. The picture of the stiff and jerking gait is so distinctive that once seen the impression remains. Almost without exception they are the result of an error—congenital, inflammatory, or traumatic—of the central nervous system.

Mechanical limps. It is with this variety that I have had the greatest difficulty in nomenclature. I feel there must be some more expressive and representative term, but I cannot light upon it, and therefore, in place of a better, I have used the word "mechanical." By using this term, I mean to imply that the limp arises from an error in alignment of the various portions of the osseous system which forms the skeleton of the lower limbs, and of the possible errors in alignment there are these common ones:

Actual shortening of the limb.
Adduction of the limb in relation to the plane of the pelvis.
Abduction of the limb in relation to a similar plane.

The mechanical limp may therefore have such widely divergent origins as a congenital dislocation of the hip, coxa vara, bow-legs, knock-knee, and former hip-joint disease, which, though cured, has resulted in abduction or adduction of the limb. In the mechanical limp, as I intend it to be expressed, there is no muscular weakness and no joint pain—it is purely the result of a mechanical error in the relationship to one another of the bones which form the lower extremities.

Stiff limps. This is the last general group I propose to recognize. It depends upon an ankylosis of one or other of the joints of the lower extremities—hip, knee, ankle, or tarsal joints.

Now that I have given this rough general classification let us reconsider the position.

By closely watching the child as it walks in front of you I believe it is possible to classify the limp into one or other group, and this by simple observation alone, without putting the hand upon the limb. Of course, there may be some overlapping in the classification. For example, I can quite well imagine a gait or limp which is "painful," and yet has some mechanical error which demands that it should be included in the "mechanical" class. Similarly, a mechanical limp may be combined with a stiff limp. I need not, however, enlarge upon these combined types.

Distinctive Features of Each Class.

Each variety of limp has one or more distinctive features by which we are able to recognize it.

The functional limp would appear at first as though it were a painful limp of an exaggerated degree, but it has two features which should at once arouse suspicion. The first is that every now and again the heel is quite firmly brought to the ground. Now, in a true "painful" limp this manœuvre is most carefully avoided, except in the rare instances in which the origin of the pain lies in the fore part of the foot. The second distinctive feature of the functional limp is its variability in degree. At one moment it may be of the most exaggerated type, at another the limp is lost entirely, to be instantly reacquired. These two features, combined with the fact that on careful physical examination no lesion can be found, generally justify one in classifying a certain variety of gait or limp as "functional."

The painful limp. When a child has a diseased and painful focus in a limb it is most likely that pressure will increase the pain; therefore the distinctive point about the painful limp is the quite apparent unwillingness of the child to allow the full weight to be borne by the limb. It reduces to a minimum the amount of time during which the limb has to bear pressure, and same orthopaedists have descriptively termed it "the hurrying limp or gait." There are two other features generally present in painful limps. The one is that in order to avoid any jarring of the limb the heel is kept off the ground; exceptions to this rule are those cases in which the situation of the pain lies in front of the ankle-joint. The other characteristic feature lies in the fact that the various joints of the limb are held in a semi-flexed condition. This has as its explanation the attempt to diminish any jarring of the limb.

The flaccid limps are generally characteristic, and, according to the various groups of muscles which may be affected, different types of the flaccid limp appear. When the muscles round the ankle-joint are involved there is a distinctive high-stepping gait, with exaggerated lifting of the limb, in order to carry the paralysed foot clear of the ground. Around the knee-joint the extensor group of muscles are those most commonly affected, and in these cases the limp is very typical. The arm of the affected side is brought into use, and the knee is maintained in the extended position by keeping the hand firmly pressed against the front of the knee or thigh, the body being thrown forward to enable this manœuvre to be carried out. If the muscles round the hip-joint are extensively paralysed it is likely that the child will be unable to walk without artificial support; if, however, the paralysis in this region is limited and walking is possible, there is a characteristic outward swing of the limb with the foot in an everted position.

In all the flaccid paralytic limps the distinctive feature is the want of control over certain movements, with often exaggerated manœuvres of the healthy muscular groups.

The spastic limp. I need say very little of the characteristics of this type. The spastic condition of various groups of muscles is responsible for the spastic or "stotting" limp. The gait is forcible and jerky. It is well illustrated in spastic equinus, and it finds its most marked degree in the spastic diplegia or Little's disease. It is a limp which, once appreciated, is always easy of recognition.

The mechanical limp. I have defined the mechanical limp as being dependent upon an error in alignment of the bones which collectively form the skeleton of the lower limbs—I include therefore the pelvis. Of the possible errors in alignment there are three which I would mention as being responsible for characteristic mechanical limps—

Pure shortening of the limb.
Adduction of the limb in relation to the plane of the pelvis with apparent shortening, and
Abduction of the limb with apparent lengthening.

In the pure mechanical limp the limb is used as confidently as a normal limb—there is no muscular weakness, and no pain; the limp is therefore the result of the patient's effort to overcome the mechanical error which deformity or former disease or injury has induced.

If the error lies in pure shortening of the limb (as is evidenced in congenital dislocation of the hip or in a fracture with shortening) there is a simple sinking of the pelvis towards one side. The sinking limp is best illustrated in a case of congenital dislocation of the hip, because in this condition not only is there shortening present, but, owing to the imperfect fixation of the hip, a further sinking is induced as weight is put on the limb.

If the limp arises from abduction of the limb in relation to the pelvis, the deformity may be wonderfully disguised. There are two points, however, which distinguish it—the patient walks with a broad base, keeping the feet well apart, while as each step is taken on the affected limb the body sinks towards that side. Frequently also the whole limb on the affected side is held stiffly, while it is swung outwards and forwards as progress is made. As a matter of fact, the pure mechanical limp of abduction is rarely seen. An abduction stiff limp is much more common. Here there is an ankylosis at the hip-joint, and, as the result of treatment of such a condition as a tuberculous hip, ankylosis has occurred in an abducted position.

Adduction of the limb produces one of the most characteristic and most distressing of all limps. To be able to walk efficiently the patient must go through a complicated manœuvre, and as each step forward is taken a series of movements is really carried out. From the adducted position the limb is first abducted, and to do this the body is tilted toward the opposite side; the limb is now adducted to bring it as far as possible parallel to its fellow, the pelvis and the body sinking towards the affected side. As these lateral movements are in progress, forward movement is at the same time being carried out. It is easy to imagine the exertion and the deformity entailed in an adduction mechanical limp.

Stiff limps. The question of stiff limps I shall dismiss in a word. Whenever a joint of the lower limbs is ankylosed or stiff, a limp results. Stiff tarsal-joints and ankle-joints give a characteristic wooden appearance to the walk. This deformity is often wonderfully disguised. The knee, if ankylosed in a position of slight flexion, may give rise to wonderfully little disturbance in the walk, but a characteristic stiffness is always noticeable. The limp of an ankylosed hip is a combination of the stiff gait and the mechanical gait, according to the position in which the limb is ankylosed, and the shortening which may be present.

Examination of the Limb after Classification of the Limp.

My thesis up to this point has been that by observation of the method of walking it is possible to classify the majority of limps into certain groups, and, when this has been done, a great advance has been made towards the final diagnosis. But this is not sufficient—it is necessary now to localize the exact situation of the limp and, if possible, to come to an opinion regarding the pathological condition which is at fault. Now these points of knowledge can only be gained by a close study of the history and by a careful examination of the limb.

There is little I need say in regard to the history: while the parents' story is often misleading in so far as an injury, imaginary or real, always bulks largely in their eyes, one must remember that the natural maternal instinct of the mother qualifies her as an exceptionally shrewd observer. The history may be of great importance in recognizing the congenital nature of a limp. But, apart from the consideration of the history, the ultimate diagnosis will depend on the accurate examination of the limb.

The child, who should be stripped, having walked before me, I begin by noting the position of the limb as a whole—does it lie in a normal or in a deformed position? I survey the skin for any pathological appearance; I estimate by comparison of the two limbs the degrees of muscular development or wasting, and here I bear in mind a very simple, yet a very important, clinical fact—namely, that if the muscles of a segment of the limb are wasted (paralysis and dystrophies being excluded), there is some pathological change in the joints and bones over which these muscles play.

Any alteration in the outline of the limb is now looked for as being representative of an abscess or collection of fluid. My eyes are now directed to the joints of the limb;

the relative positions of the bony points are estimated, any joint fullness or error in position is noted.

Only when I have exhausted the observations of which my eyes are capable do I attempt to use my hands, and the use I make of them is largely to confirm what my eyes have already told me. I estimate by feel the character of the skin, I investigate any local swellings, I carefully palpate in turn each structure which collectively forms the limb. I therefore palpate the subcutaneous tissues, the muscles, the bones, and the joints. For example, my hands will tell me whether a swelling in relation to a joint is osseous, is due to a thickened synovia, or to the excess of fluid within the joint. I very carefully estimate the relative position of the bony points around a joint—this in view of a dislocation being present.

I then proceed to the investigation of the muscular functions of the limb. As far as possible, voluntary movement of the various groups of muscles is elicited. In the child this may be difficult, but by a little ingenuity and the exercise of patience the difficulty is overcome.

The joint movements are now investigated—first actively, then passively. Each movement of which the joint is capable is tested. Examination of the passive movements of the joint is, perhaps, one of the most important of all the stages of the survey; the results bulk so largely in the differential diagnosis. For example, I can imagine four pathological conditions in relation to the hip-joint, all of which are associated with a limp, and from examination of the passive movements of the hip-joint alone I can form at least a provisional distinction between them. Let me illustrate: If I am dealing with early tuberculous disease of the joint, flexion and rotation are limited by muscular rigidity. If Perthes's disease (osteochondritis deformans juvenilis) is the condition present, flexion is perfect, while rotation is limited; if there is a congenital dislocation of the joint, abduction and external rotation are limited; in coxa vara abduction only is affected.

I now proceed to measurement of the limb. First, the ileo-malleolar measurements are taken, and, if true shortening is shown to be present, I localize the situation by subdividing the original measurements into three—from the adductor tubercle to the median malleolus, from the tip of the great trochanter to the tubercle of the tibia, and, thirdly, by the estimation of Bryant's triangle or Nélaton's line. In one of these three areas I shall find the shortening. The second group of measurements, as estimated from umbilicus to median malleolus (the iliac spines being on the same plane), will give me an estimate of apparent shortening or apparent lengthening—in other words, of abduction or adduction of the limb.

There is another point in the examination of the limb to which I would allude. There are certain muscles which pass into the limb from a higher origin, and of these the psoas is the most important. It is therefore always wise to include an examination of the lower abdominal viscera and the lumbar spine in the routine investigation. Tuberculous disease of the lumbar spine with associated contraction of the psoas muscle produces a limp which is closely similar to that produced by hip-joint disease.

Up to this stage the examination requires no special apparatus or facilities, and by the time this stage is reached the diagnosis will probably have been made. The further examination ought to be rather confirmatory than otherwise; it will take the form of radiographic examination of the bones and joints of the limb. In these days, when *x*-ray facilities are so general, I am afraid we tend to resort to them too readily. If we do, then our clinical acumen will suffer. It is wiser to treat them as a diagnostic luxury, and to use them as confirmatory or otherwise of a clinical diagnosis.

I have no intention of attempting to describe the distinctive limp in individual diseases—I question very much if such a thing is feasible. My idea has rather been to look at the problem from a general aspect, and to attempt, if possible, to formulate a scheme upon which the problem may be worked out. If I may put the scheme into a few words (and after all it is so simple that perhaps the word "scheme" is too pretentious) the idea upon which I work is primarily to classify the limp, and this classification may be made entirely by observation of the gait; the type having been recognized, detailed examination of the limb will generally succeed in localizing the site and the nature of the condition which has produced the limp.

The Treatment of Limps.

In this connexion, of course, it is only possible to speak in general terms. Each individual condition must be treated upon independent and special lines; but it is possible to express general ideas on the subject.

If it is decided that the limp is functional, the less the attention paid to it the better. Sympathy and local treatment will probably intensify and prolong it. The child responds readily to suggestion treatment. I have seen a girl with a pronounced functional limp walk normally after a short period of suggestion treatment. [A film representative of this case was shown.]

Painful limps call for early and careful treatment. The exact localization and pathological condition of the disorder must be recognized, and, this having been done, painful limps are treated by rest and immobilization of the part. We may take it, therefore, that for the limps recognized as being in the painful class, efficient rest of the limb is the first essential in treatment. Later, and depending on the pathological condition at fault, more special surgical treatment may be demanded, but with these indications I do not propose to deal.

Flaccid limps suggest wide possibilities of treatment; as the majority owe their origin to poliomyelitis, I would remind you that prevention is better than cure. During the acute stage of the illness, and subsequently, accurate splinting of the part in such a position as to relax the weakened muscles may well obviate the later development of a limp. When the limp has become established, mechanical treatment and operative treatment offer the most promising lines of treatment. In this connexion in recent years surgery has made enormous strides—tendon transplantation, silk fixation, and arthrodesis are often successful in restoring function to an otherwise useless limb.

Mechanical treatment by splints in children is often disappointing. The appliances should be of the simplest possible description, but the weight, the effort entailed in their use, and the education required are often detrimental to success. The present aim of surgery is to reduce to a minimum the use of mechanical appliances.

Spastic limps call especially for educational efforts. Occasionally surgery steps in beneficially with such simple procedures as tenotomy and tendon lengthening, but the intelligent use of corrective splints applied at night and careful education during the day produce good results.

Mechanical limps call for a special word of warning, and it is this: I believe that as a general rule it is a wrong principle primarily to condone a mechanical limp by some mechanical appliance. The common essential feature of most mechanical limps is shortening, and the aim should be to correct, if possible, the mechanical error which is producing the shortening, rather than to disguise it by such a procedure as heightening the boot sole. This should only be done as a final stage in treatment and after all other errors, such as adduction, etc., have been corrected. If raising the boot sole is the only remedy adopted, it may lead to a progressive increase in shortening.

Stiff limps generally call for little in the way of treatment. It is essential, however, that the part affected should be in the best possible position for subsequent ambulation. In the treatment, therefore, of any joint condition which may end in ankylosis, it is essential that care should be taken so to arrange matters that where ankylosis subsequently occurs, the joint concerned is in the best possible position—the ankle should be at right angles to the leg, the knee very slightly bent, and hip in moderate abduction, with slight outward rotation of the limb.

At one time we hoped that arthroplasty offered a possible method of restoring movement to ankylosed joints, but I am afraid that in the lower limb, at least, the results have been disappointing. We realize that there are worse things than a joint firmly ankylosed in a good position.

These are some of the points which have occurred to me in discussing the subject of limps. There is nothing new or original in the matter brought forward: I have merely attempted to put the subject before you in a consecutive light.

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THE detoxication of vaccines has recently attracted considerable attention. Thomson's method[1] depends upon the fact that alkaline solutions dissolve organisms and their toxins whilst mineral acids precipitate the organisms but retain the toxins in solution. The chief merit of this method is that the final concentration ready for administration can be adjusted to any desired strength. Professor H. R. Dean[2] has shown that a suspension of virulent organisms can be detoxicated by the action of eusol or hydrogen peroxide in weak solution. The author has found it convenient to employ a method which embodies these two principles.

The term "detoxicated" is unfortunately somewhat misleading, and has even caused this type of vaccine to be looked upon with a certain amount of suspicion in some quarters. It has been thought that a preparation which is itself non-toxic cannot be expected to stimulate a protective reaction on the part of the tissues. If this were so, these vaccines might with reason be suspected. But it can be shown that they possess a toxicity of a definite type, and that this toxicity is contained in the bacterial residue which remains after the complete removal of the toxins and endotoxins. It therefore appears to the author to be more in accordance with a true description of them to call them vaccines of the bacterial residue, or more briefly, residual vaccines. The term "toxin" as used to-day has a restricted meaning, and in order to avoid confusion the toxic properties of the residue will be, as far as possible, referred to as the residual toxicity rather than the residual toxin.

Technique.

A sufficient quantity of growth is usually obtained from two or three Petri dishes. The growth is emulsified with about 100 c.cm. of a 1 per cent. solution of phenol in sterilized tap water and the emulsion poured into a tall glass. The volume is noted and the number of organisms per cubic centimetre estimated. From a pipette sufficient 40 per cent. NaOH is added to form a 0.5 per cent. solution. The suspension is then set aside for an hour. During this time the suspension loses most of its opacity and becomes translucent, but rarely quite transparent. Strong HCl is next added drop by drop until the fluid is neutral to litmus, after which one drop of the acid is added for every 10 c.cm. of fluid, which is now opaque once more. Lastly, hydrogen peroxide (10 vols.) is added in the proportion of 1 c.cm. to every 50 c.cm. of suspension.

The vessel is placed in a 55° C. oven and remains there for twenty-four hours, at the end of which time the organisms are found lying at the bottom of the glass as a dull white precipitate. The supernatant fluid containing the oxidized toxins is clear, and should be decanted, leaving the deposit behind. More 1 per cent. phenol is now added to make the fluid up to its original volume and acid added as before—namely, 1 drop to every 10 c.cm. Peroxide is not added. Sedimentation is usually complete in three to six hours. The supernatant fluid is again poured away, the deposit neutralized by 40 per cent. NaOH, and the suspension made up to the required strength by the addition of normal saline, no further phenol being added, so that the final concentration contains phenol in a strength of 0.5 per cent. or less. Since tap water and not saline was present in the residue it might be thought that the final preparation is hypotonic, but the neutralization of the NaOH produces a solution of sodium chloride near enough to the strength of normal saline.

The strength per cubic centimetre and the dosage will depend upon the ratio of residual toxicity to the total toxins present in a culture grown upon a suitable medium. This ratio varies for different organisms, but a safe rule is to make the vaccine 100 times the strength of the corresponding ordinary vaccine, and to commence treatment with a small trial dose. No absolute rule can be laid down. The idiosyncrasy of the patient is just as evident with these vaccines, but as a rough guide it may be said that the initial dose of a residual vaccine should never exceed 1,500 millions.

* The expenses of the laboratory side of this work were assisted by a grant from the Department of Pathology, University of Manchester.

The last stage in the preparation is the sterilization, which is performed in the autoclave by heating for fifteen minutes at a temperature of 120° C. When the bottle is removed from the autoclave a fine precipitate is usually present, the supernatant fluid being almost clear. Both fluid and precipitate react normally to acids and alkalis; the deposit is easily passed into suspension again by slight shaking. Sedimentation is used instead of centrifugalization, because experience proved that to yield results a centrifuge must be of fairly large capacity and be capable of very high speed.

Sedimentation is slower, but the use of Dean's method reduces the washings to two and so tends to equalize matters. The oxidation method cannot be used alone because of its liability to produce a vaccine of inconveniently large bulk. The rate of sedimentation varies with different organisms, but the most refractory can be made to deposit quickly by boiling the alkaline solution for a minute or two, then adding the acid and setting aside in the 55° C. oven as usual. There is no need to repeat the boiling in subsequent washings.

How long the vaccine keeps without deterioration is uncertain, but it is much longer than is the case with thermolabile vaccines. The reaction of one particular vaccine was as strong as ever fifteen months after it was made; another, when nine months old, also showed no change in its toxicity.

Examination of the Precipitate.

The gonococcus was used to investigate solubility in NaOH. An emulsion containing approximately 1,000 millions per cubic centimetre was made with normal saline and a film examined. The cocci were of normal appearance. The suspension was converted into a 1 per cent. solution of NaOH. Much of the opacity immediately disappeared and the fluid became translucent, almost transparent. A film showed cocci present in large numbers with no amorphous deposit.

The suspension was next heated to 55° C. for forty-eight hours and resulted in a perfectly transparent fluid. A film showed cocci in greatly diminished numbers and a large amount of débris. It is difficult to give a precise estimate, but it seemed that about two-thirds of the cocci had disintegrated. It would therefore appear that the translucency is due to swelling of the organisms with an alteration in their light transmitting properties. True solution occurs later after comparatively prolonged action of the alkali. The observations were repeated with *B. coli* and gave similar results.

Reaction on Patients.

It is stated that the toxic symptoms seen with ordinary vaccines do not occur with residual vaccines. This is not in accordance with the author's experience. A local reaction is the most noteworthy feature. Shortly after inoculation a red area, slightly swollen, appears round the site of injection. It is commonly about three inches in diameter and painful to pressure, but not otherwise painful. The constitutional disturbance is variable, but in general is less than that seen with ordinary vaccines.

Clinical Results.

Over two hundred cases have been treated up to the present time, and according to reports received from the clinicians the results have been very satisfactory. There have been failures, but the results on the whole have been better than those one would have expected if the cases had been treated with the older type of vaccine. This is a facile statement, and one is aware that a detailed account is preferable. Circumstances arose by which more exact information was obtained.

A stock ordinary vaccine was required for a few men suffering from chronic bronchitis, and it was decided to treat a further number of patients with residual vaccine. These latter comprised that large group of cases of chronic bronchitis to be found attending the out-patient department of any large general hospital. They could not be said to offer much prospect of success with any form of treatment available to people in their station in life. Cases with severe cardiac or renal complications were excluded, otherwise no restriction was placed upon the age of the patient or upon the origin or duration of the disease; in fact for a period of six or eight weeks the out-patient department was drained for cases.

A large stock of a mixed suspension was collected, and from it was prepared an ordinary vaccine having the following composition:

M. catarrhalis (7)	...	...	70 millions per c.cm.
Streptococcus (4)	...	...	15 ,, ,,
Pneumococcus (4)	...	...	25 ,, ,,
Friedländer's bacillus (5)		...	50 ,, ,,
B. influenzae (3)	...	...	10 ,, ,,
Hoffmann's bacillus (3)	...	...	30 ,, ,,
M. pharyngis siccus (1)	...	...	10 ,, ,,
Staphylococcus (6)	...	...	20 ,, ,,

The figures in brackets denote the number of sources from which the organisms were obtained. For the sake of brevity this vaccine will be referred to as the "O" vaccine.

The remainder of the stock was converted into a residual vaccine by the method previously described, except that it was divided into three parts, which were each sterilized in a different way. The first part was sterilized at 55° C. by means of 1 per cent. phenol acting at that temperature for twenty-four hours. This was called the "X" vaccine. The second portion was sterilized by heating at 95° C. for sixty minutes, and was called the "S" vaccine. The third part was sterilized in the autoclave, and called the "A" vaccine. Except for the method of sterilization these three vaccines were identical, and were made 100 times the strength of "O."

At this point it might be objected that any merit this type of vaccine may possess is due to a small amount of toxin which has escaped removal. In the case of "X" it would be 1/100th part of that originally present in "O" if, as was the case, the reaction caused by a given volume of either was approximately the same. The point can be discussed forthwith.

When a suspension is detoxicated by simple solution and sedimentation, the deposit is usually in volume 1/10th to 1/15th of the supernatant fluid, and the soluble toxins present in the water of the deposit will therefore be 1/10th to 1/15th of the total toxins originally present. But if the washing is repeated six times, the amount of toxin remaining will be considerably less than one millionth part of their former amount, if simple mechanical washing is the whole explanation.

Further, the reaction is not appreciably less if the organisms are washed twelve times instead of six, or if the author's combined method is used. Lastly, the suggestion does not explain the oxidation process in which the peroxide is evenly distributed throughout the suspension. The theory will not meet the facts. Most bacterial toxins are destroyed by a temperature of 80° to 90° C. The behaviour of the residue will be seen later.

A Series of Chronic Bronchitis Cases.

The results are presented in tabular form, and the intensity of the reactions and the amount of clinical improvement are shown by numerals which have the following significance:

Local Reactions.

0=No reaction.
1=Swelling, no pain; possibly tender on pressure.
2=Swelling with erythema; painful, and stiff on movement.
3=As in 2, but more pronounced. Erythema more than 3 in. in diameter. Shooting pain along arm in addition to pain at site of injection.

General Reaction.

0=No reaction.
1=Slight lassitude, but no definite malaise.
2=Patient feels unwell, with headache and disinclination for food. Malaise disappears in twenty-four hours.
3=Malaise more marked and lasting two or three days.

Degree of Improvement.

0=No improvement.
1=Slight, but clinically evident improvement.
2=Moderate improvement with paroxysms of coughing much diminished.
3=Marked improvement with complete, or almost complete, cessation of nocturnal asthmatic attacks.

Note.—The improvement was estimated by the physician to whom the case belonged and who was not informed as to what type of vaccine the patient had received, or the dosage.

"O" Vaccine.

Patient.	Age.	Duration of Disease in Years.	First Dose.			Last Dose.			Number of Doses Given.	Degree of Improvement.
			Amount in Minims.	General Reaction.	Local Reaction.	Amount in Minims.	General Reaction.	Local Reaction.		
L. 4 ...	40	3	2	1	1	14	2	0	6	0
S. 16 ...	51	7	2	1	0	18	2	0	7	1
A. 4 ...	38	5	2	1	0	17	2	1	6	3
A. 2 ...	46	4	2	2	1	16	3	3	6	3
A. 3 ...	40	4	2	2	1	16	3	3	6	1
L. 6 ...	47	4	2	2	1	18	2	0	7	2
L. 14 ...	50	5	2	1	0	18	1	0	6	1
L. 7 ...	35	2	2	1	0	17	2	1	6	1
S. 18 ...	38	3	2	3	2	10	3	0	6	3
Average improvement										1.66

"X" Vaccine.

Patient.	Age.	Duration of Disease in Years.	First Dose.			Last Dose.			Number of Doses Given.	Degree of Improvement.
			Amount in Minims.	General Reaction.	Local Reaction.	Amount in Minims.	General Reaction.	Local Reaction.		
L. 1 ...	35	4	3	1	2	15	2	3	7	3
L. 2 ...	42	5	3	1	3	17	1	3	7	2
L. 3 ...	46	5	3	2	1	17	1	3	7	2
S. 1 ...	45	6	2	3	3	10	1	3	7	1
S. 2 ...	32	6	2	1	2	15	2	3	7	3
S. 3 ...	38	5	2	1	2	13	2	3	7	3
S. 4 ...	47	6	2	2	2	7	2	3	7	1
S. 5 ...	36	4	2	1	0	11	0	3	7	1
S. 6 ...	49	5	3	1	1	7	1	3	7	3
S. 7 ...	48	5	3	1	1	12	0	2	7	1
S. 10 ...	35	3	2	2	1	5	0	2	4	3
S. 13 ...	41	3	2	1	1	6	1	2	4	3
F. 1 ...	28	3	2	2	3	8	0	3	5	3
L. 5 ...	43	4	2	2	2	13	0	1	7	2
S. 18 ...	42	3	2	1	3	9	2	3	5	3
H. 5 ...	37	6	2	0	2	8	2	1	5	3
L. 27 ...	38	4	2	0	1	7	1	3	5	0
H. 7 ...	35	2	2	1	3	10	2	3	6	2
H. 1 ...	42	4	2	1	1	12	0	0	6	1
Average improvement										2.21

"S" Vaccine.

Patient.	Age.	Duration of Disease in Years.	First Dose.			Last Dose.			Number of Doses Given.	Degree of Improvement.
			Amount in Minims.	General Reaction.	Local Reaction.	Amount in Minims.	General Reaction.	Local Reaction.		
S. 8 ...	39	5	2	0	1	13	1	2	7	3
L. 22 ...	41	8	2	2	2	7	2	3	5	2
H. 6 ...	38	4	2	0	1	9	1	2	4	3
A. 1 ...	35	3	2	1	2	7	2	2	5	1
L. 9 ...	39	7	3	1	2	10	1	3	5	1
L. 15 ...	46	6	2	2	2	9	1	2	6	3
Average improvement										2.16

"A" Vaccine.

Patient.	Age.	Duration of Disease in Years.	First Dose.			Last Dose.			Number of Doses Given.	Degree of Improvement.
			Amount in Minims.	General Reaction.	Local Reaction.	Amount in Minims.	General Reaction.	Local Reaction.		
S. 9 ...	36	4	3	1	2	14	2	3	7	2
S. 11 ...	41	4	3	0	3	10	1	2	5	2
S. 12 ...	43	5	2	1	1	8	0	2	5	3
L. 10 ...	47	7	2	0	1	11	0	1	5	2
L. 11 ...	43	11	3	2	3	8	0	1	6	3
L. 12 ...	33	4	3	1	1	14	1	2	6	2
L. 17 ...	28	4	2	1	2	7	2	3	6	2
L. 18 ...	39	5	2	0	0	8	1	2	6	3
L. 19 ...	42	8	2	1	2	6	2	3	5	3
L. 20 ...	44	5	2	2	3	8	0	2	6	3
L. 21 ...	35	4	2	1	0	8	0	1	5	2
S. 14 ...	43	6	2	3	3	7	2	2	6	0
A. 5 ...	34	4	2	1	1	8	2	3	4	1
L. 23 ...	45	6	3	2	3	6	3	3	5	0
L. 8 ...	41	3	2	3	2	9	3	3	7	3
L. 16 ...	36	3	2	1	2	9	1	2	5	3
S. 17 ...	54	8	2	0	1	10	2	3	5	3
L. 24 ...	37	3	3	1	2	8	2	3	4	3
L. 13 ...	44	5	3	1	2	12	1	1	5	3
L. 25 ...	33	4	2	0	0	9	2	3	5	3
H. 8 ...	47	4	2	0	0	9	3	3	6	1
H. 9 ...	36	3	2	0	1	10	2	3	6	2
H. 11 ...	34	4	2	2	2	7	1	1	5	1
H. 12 ...	35	3	2	0	1	8	2	2	5	3
H. 4 ...	34	2	3	3	3	6	1	3	5	2
H. 3 ...	56	8	3	0	1	8	2	3	6	3
H. 10 ...	38	4	2	0	1	10	2	3	6	3
Average improvement										2.30

It is recognized that this method of presenting the facts is open to criticism, but it is the only way in which the records of such a large number of cases can be kept within reasonable limits. The use of the minim scale was determined by the available supply of hypodermic syringes.

Analysis of Results.

The "O" results are not put forward here to demonstrate that residual vaccines are superior to thermolabile vaccines—as in fact they are—but to afford a comparison of the general and local reactions, and hence of the toxicity.

The average of the general reactions in the "O" group is slightly greater than that in the "X," "S" and "A" groups, but the local reactions in these latter exceed those in the former group, and are possibly to be explained by the imperfect solution of the bacterial débris with consequent slow absorption, this in turn necessitating a strong local reaction to break it up and pass it into solution.

The reactions of the "A" group prove that a temperature of 120° C. is not detrimental to a residual vaccine, so the "S" results are superfluous, and should be read as part of the "A" group.

A very noticeable feature of the constitutional disturbance caused by the residual vaccines was the frequency with which it was of an intestinal nature. Whenever a "G.R. 3" was produced a disinclination for food was invariable, and in about half the cases was accompanied by some vomiting and diarrhoea. The latter symptoms disappeared in eight to twelve hours after their onset. Diarrhoea alone and of mild degree was common also with milder reactions, but only after the first or second dose. The gastro-intestinal disturbance was never seen in the "O" group, and it would therefore appear that bacterial residues differ from thermolabile toxins in their physiological action as well as in their chemical properties. This phenomenon has been observed with other vaccines of the same type, but only when either the pneumococcus or streptococcus was contained in the vaccine.

Another point which is brought out in the tables is the size of the last dose given. It will be noticed that the "O" group reached an appreciably higher number of minims than any other group, and during the course of treatment one could not help observing that the "O" group tolerated much greater percentage increases of dosage. When weighing this fact it should be recollected that all four groups started with the same number of minims to which they reacted to approximately the same extent.

It is a common method when using thermolabile vaccines to increase each dose by 30 to 40 per cent. above the preceding dose, and one therefore works by a geometrical progression; the method is not applicable to residual vaccines, or is so only within narrow limits. The patient cannot tolerate such increases.

The dose should be increased by some fixed amount—which was two minims in this particular series—and even then many patients required the same dose repeated once in order to establish a comfortable tolerance. It was abundantly clear that the defensive mechanism of the tissues found a greater difficulty in dealing with the toxicity of the residue.

The improvement after each dose of all the residual vaccines was greatest after the first three or four. The later doses produced a much slower improvement until it ceased altogether after the seventh dose or thereabouts. It is hoped to investigate this further at a future date. The extent of the benefit, as well as the reactions, in the "X," "S," and "A" groups is equal, and is a further proof that heat is not detrimental to the residue. The simplicity of sterilization in the autoclave compared to the usual gentle heating and subsequent testing by cultural methods is obvious.

Nature of the Toxic Substance in the Residue.

It will be apparent that the residue contains a toxic substance. Vaughan[3] has shown that certain toxic bodies, apparently allied to proteins, can be obtained from bacteria, and that these bodies withstand a much higher temperature than do toxins and endotoxins. It has further been shown that some degree of immunity can be created against them, and that the local reaction when they are injected is intense. The precise origin of the toxicity may be somewhat vague, but it is evident that the residue possesses some properties which show fundamental differences from those of thermolabile toxins, and which are striking enough to justify one in separating the residual toxicity from the endotoxins.

The two cardinal features which distinguish the class are:

1. They are not rendered inert by weak solutions of oxidizing agents.
2. Their toxicity is neither destroyed nor impaired by a temperature of 120° C.

In this investigation the extent of constitutional disturbance has been taken as the standard by which to compare the toxicity of the residue with that of the thermolabile toxins. It is a reasonable physiological test, but it should be remembered that it is only a measure of the relative toxicity; it affords no indication of the relative weights of the two classes present in a culture or of the relative toxicity of the types if equal weights of each are taken.

The dose of an ordinary vaccine depends upon the amount of toxin present. The strength is stated in organisms per cubic centimetre because that is the only method of measurement available, unreliable as it is. The number of organisms is no real guide to the dose, for different strains of the same organism vary enormously in toxicity, and the amount of toxin produced by any given strain varies with the medium upon which it is grown. It is not possible to standardize the thermolabile toxin, for that substance is very unstable and becomes inert from many causes, all of a comparatively trivial nature. If the toxin is standardized when the vaccine is made, the result may be worthless in less than a month. Furthermore, the production of toxin is not an essential metabolic process, so the destruction of it does not necessarily incommode the organism at all. Antitoxins will neutralize toxins and nothing else.

It is true that a thermolabile vaccine contains bacterial protein, but only because of its accidental and unavoidable presence as part of the organism which accompanies the toxin. Its amount is small and the actual quantity quite indefinite. In effect the patient is immunized against the toxins. The destruction of the organism is left to the tissues to manage as best they can.

The rationale underlying residual vaccines rests upon a more solid basis. In these the toxic substance against which immunity is produced is the tissue protein of the organism itself, the preservation of which is essential to the life of the parasite, and the vaccine is therefore designed to strike at the primary cause of the disease; if the causal organism is destroyed its toxin can be ignored, for it will disappear whether the patient destroys it or does not.

The counting of the organisms in a residual vaccine yields information which remains accurate, the relationship of the toxic residue to the organisms being a fixed ratio, and since the residue is very stable, its toxicity does not change with age.

Finally, the therapeutic results obtained with these vaccines are more uniform. The degree of improvement is quite as great in the most promising cases, and a larger proportion of the cases benefit by the treatment. Almost all the cases in this series were drawing either a pension or sick pay, and this fact undoubtedly influenced their own estimation of the benefit received. Physical signs may be negligible or altogether absent, but it is impossible to disprove that a man still has a cough, and for this reason no case has been entered as cured. It is fairly certain that the estimates of the improvement are not unduly sanguine. This aspect of the work was realized from the start, but previous experience with the vaccine had inspired a belief that it would justify itself even under a handicap that amounted to an unfair test.

Since it has been shown that the effect of heat upon the residue is *nil*, the "X," "S," and "A" sections can be amalgamated into one large group in which the clinical benefit derived from residual vaccines can be demonstrated in a short table:

	Degree of Improvement.			
	Nil.	Slight.	Moderate.	Considerable.
Total number of cases treated, 52	3	9	13	27
Percentage	6	17	25	52

CLINICAL NOTES.

Chronic bronchitis as a distinct entity is especially prevalent in Manchester and Salford. Many cases date from an attack of acute bronchitis contracted on active service in France. Attacks of a spasmodic or asthmatic type are very frequent. The expectoration varies greatly in different cases, but is usually abundant and muco-purulent.

The physical signs include marked diminution of expansion and respiratory capacity, hyper-resonant percussion note, and widespread mixed râles and rhonchi. There is marked deterioration in health and capacity for employment, and as a rule there is evidence of cardiac muscle weakness.

In the presence of such changes in the physical state of the chest, and probably of permanent changes in the anatomical structure of the lungs, the influence of vaccine treatment must necessarily be limited, but several salient facts emerge from observation of a series of cases treated in this manner:

1. In most cases there is distinct improvement in the patient's general condition, in colour, vigour, and capacity for activity.
2. The sputum, which may at first increase in amount, in practically every case diminishes in quantity and loses its muco-purulent character, becoming white and less profuse.
3. The cough becomes less persistent and the attacks or paroxysms much fewer and less severe, particularly those occurring in the night and early morning.
4. A striking feature has been relief from asthmatic attacks; from the clinical point of view this is the most conspicuous effect produced by the treatment.

The clinical observers have not known the type of vaccine employed in any given case, and the results must speak for themselves.

Summary.

1. It is not possible, short of gross destruction, to detoxicate completely a suspension of pathogenic bacteria.
2. The residual toxic substance is not affected by a temperature of 120° C., it is not destroyed by weak solutions of oxidizing agents, but it is precipitated by mineral acids.
3. It is possible to remove from a suspension of organisms all the thermolabile toxins and endotoxins. Thomson's method, Dean's method, or that of the author are equally efficient.
4. It is probable that the residual toxic body is an integral part of the bacterial protoplasm.
5. Residual vaccines can be sterilized in the autoclave, so sterilization is simple and certain.
6. Residual vaccines are highly efficient therapeutic agents.
7. They retain their maximum efficiency indefinitely.
8. Most cases of uncomplicated chronic bronchitis respond to treatment by residual vaccines.

The author cannot conclude without acknowledging his indebtedness to Professor Dean for much valuable advice and constructive criticism, and to the physicians who contributed the clinical notes for their kindness in undertaking the large amount of clinical work which this investigation required.

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ENCEPHALITIS LETHARGICA.

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[AFTER a brief reference to the history of the disease, and the use of the term "encephalitis lethargica," Dr. Haynes quoted a classification of the symptoms given by Dr. F. M. R. Walshe in *Brain*, November, 1920. The primary division was into general symptoms and nervous symptoms. General symptoms were such signs of toxic infection as fever, eruptions, malaise, pain, headache, and gastro-intestinal disturbance. The nervous symptoms were general or focal, and in each case were classified as positive or negative, the terms being employed in the sense in which Hughlings Jackson originally used them.]

Positive symptoms are expressions of exalted function, either from irritation or loss of higher control, and negative symptoms express depression or loss of function. The general positive symptoms in lethargic encephalitis are delirium, restlessness, hallucinations, and so on; the general negative symptoms lethargy and coma. The focal positive symptoms are convulsions, involuntary movements and muscular contractions, ataxy, rigidity, and pain; the focal negative symptoms are paralyses.

Recognition of these two classes of symptoms—positive and negative—is very helpful, enabling us to understand that a lesion of a single area might give rise to convulsions as well as to paralysis, and that whether a clonic twitching of a muscle or weakness occurred depended not on the site, but upon the nature of the lesion.

The disease occurs at all ages, and affects both sexes equally. Three stages can be distinguished—the prodromal stage, the acute stage, and the stage of regression. The incubation period has not yet been determined. The chief prodromal symptoms, which last usually from one to seven days, but may be prolonged for three weeks, are headache, giddiness, lethargy, blurred or misty vision, and diplopia; vomiting is not common; muscular weakness frequently occurs.

The acute stage is characterized by fever (101° to 102° F.), lasting from two to five days or longer, the pulse and respiration being as a rule unaffected. The patient lies in bed semi-conscious and immobile, or with much muscular asthenia; the face is expressionless and mask-like; the limbs in many cases are rigid, and in some they remain in any position in which they are placed, as in the condition known as flexibilitas cerea. Usually patients can be roused from their stupor to take food or to answer questions; this they do intelligently, but in a voice often nasal and monotonous, the sentences being uttered very slowly. There may be emotional irritability, and nocturnal delirium frequently occurs. In this stage muscular twitchings and tremors may occur. There is no characteristic skin eruption, though petechiae, papules, or erythema have been observed; one case was notified as scarlet fever and another as measles. *Tache cérébrale* is readily elicited in most cases. Other symptoms are dysphagia, nausea, and constipation; the tongue is dry and coated. Retention or incontinence of urine is of frequent occurrence; the urine is concentrated, loaded with urates, and transient albuminuria is found during the febrile stage.

Paralysis of the cranial nerves is a characteristic feature the third and seventh being most commonly affected. The fundus oculi is normal. Ptosis is the usual form of third-nerve paralysis; it may be unilateral or bilateral, and slight or complete. The ciliary muscle is often involved early and paralysed longer than other ocular muscles; the pupils may be unequal; divergent or convergent squint is seen; diplopia is common. Whereas ptosis and strabismus are only transient, involvement of the movements of the eyeball may last several weeks, as may disturbance of accommodation. Facial paralysis has often been observed; it is, as a rule, bilateral, but more marked on one side than the other; the tongue and pharynx are sometimes affected and deafness has been noted.

Netter's statistics place the frequency of lethargy and ocular palsies as high as 75 per cent. of all cases, but, though with fever this is the characteristic syndrome, a large number of cases do not conform to this type; some begin with excitement and muscular twitchings or spasms, or with severe pains in the limbs; others have quiet delirium with delusions; others, again, go about with persistent headache, apathy, and lack of facial expression. In fact, as Farquhar Buzzard has pointed out, an inflammation of the encephalon can produce as many symptoms as there are functions of the brain.

Of the lethargy, which is an interesting feature of the disease, three explanations have been suggested: (1) That it is due to internal hydrocephalus, the result of occlusion or partial occlusion of the aqueduct of Sylvius by inflammatory processes in the region of the corpora quadrigemina. It is noted that sluggishness or total abolition of the pupillary reflexes frequently occurs with the lethargy, and that this combination is characteristic of tumours of the posterior end of the third ventricle. (2) That it is due to interference with the afferent paths of stimuli from the

* Abstracted from a paper read before the Cambridge Medical Society.

environment, whereby stupor results. It is argued that an inflammatory lesion in the crura cerebri and optic thalami might, in addition to blocking afferent stimuli, involve the nucleus of the third nerve and give rise to the frequently observed ocular phenomena. Optic neuritis is generally absent, indicating that the lethargy is not part of a general cerebral condition, such as would be caused by hypertension, as in tumour or abscess. (3) That it is due to pressure on and inflammation of the pituitary gland. Sluggishness, with a tendency to somnolence, is a sign of hypopituitarism.

The differential diagnosis of the characteristic syndrome, with "negative" nervous signs, is to be made from the following conditions: Cerebro-spinal meningitis, in which there is commonly retraction of the head and a turbid spinal fluid containing the meningococcus; tuberculous meningitis, a somnolent form of which may occur in infancy, characterized by a dissociation of pulse and temperature and irregularity of the pulse, choked disc and choroi tubercles, with lymphocytes, albumin, and frequently tubercle bacilli in the spinal fluid; influenzal encephalitis, usually accompanied by bronchial or pulmonary signs. Cerebral syphilis is generally unaccompanied by fever; optic neuritis is frequently present, and the complement deviation test is in most cases positive. Sleeping sickness is distinguished by the presence of the trypanosome in the blood, cerebro-spinal fluid, and enlarged glands. Cerebral forms of poliomyelitis are rare; they commonly occur in the summer months; the paralyses are more generalized and are maximal when declared, whereas in lethargic encephalitis the paralyses are often slight at first but progressive. Cerebral softening, following embolism or thrombosis, or cerebral haemorrhage may simulate encephalitis, in which large areas of softening and gross haemorrhages have been found. Naked-eye *post-mortem* changes are not sufficient to distinguish between ordinary cerebral haemorrhage and a haemorrhagic encephalitis.

The diagnosis of cases presenting "positive" nervous signs, the excito-motor syndrome, is more difficult, especially when a history of an acute attack is lacking. Such cases are those showing involuntary movements and muscular contractions; they have been classified by Marie and Levy, who describe forms resembling chorea and paralysis agitans, and forms with rhythmical and myoclonic movements of the face, trunk, and limb muscles.

These excito-motor signs may not develop until weeks or even months after apparently complete recovery from the acute illness or after an unrecognized mild attack.

If no history of an initial acute illness be obtained the following minor symptoms may confirm the occurrence of a mild attack: onset of an illness with occipital headache and painful rigidity of the neck, accompanied by slight fever and nocturnal delirium; disturbances referable to the muscles of mastication, such as difficulty in opening the mouth fully, tremor of the jaw, chattering of the teeth, neuralgic pains in the distribution of the fifth nerve; attacks of facial spasm; excessive salivation; slowness and difficulty in articulation; a sense of constriction of the throat with difficulty in breathing or swallowing; frequent attacks of yawning or of hiccough; slight painful swelling of joints, and finally, neuralgic pains of root distribution and painful muscular cramps. One or more of these symptoms associated with slight signs of general infection indicate the occurrence of the initial infection.

The diagnosis of lethargic encephalitis can never depend upon the presence or absence of any symptom or group of symptoms. It must be determined by a consideration of the onset and course of the disease, and by the elimination of other pathological conditions which may produce similar symptoms and physical signs.

The course of the disease is very variable. Some cases are rapidly fatal, death being apparently due to paralysis of the respiratory nervous centres. The stupor may clear away in a few days or persist for several weeks, even as many as eight, and recovery may then ensue; pneumonia, wasting and bedsores have been noted as fatal complications.

The Cerebro-spinal Fluid.

The cerebro-spinal fluid is normal in appearance; in some cases, but not in all, it is under pressure; during the first few days lymphocytosis may occur, but this is not one of the fundamental characters of the disease, as it is of tuberculous or syphilitic meningitis, and is only of short duration; an excess of glucose is frequent but not constant, and is attributable to a certain degree of hyperglycaemia due to a lesion of the floor of the fourth ventricle.

The Blood.

The blood count is normal. Some Italian bacteriologists have isolated from broth cultures of the blood a small Gram-positive diplococcus, which was agglutinated in a dilution of 1 in 100 by the serum of the patient from whom it was isolated, and by that of other patients and of convalescents from the disease. It was not agglutinated by normal blood or by the blood of typhoid patients. Guinea-pigs inoculated with blood containing the diplococcus died on the fifth or seventh day after presenting subnormal temperature, paresis of the limbs, intense somnolence and often muscular jerkings of the limbs. The brain showed punctiform haemorrhages, especially in the grey substance.

In the Government report referred to previously, James McIntosh states that, as a rule, no macroscopic changes sufficient to account for death are found *post mortem*. A common appearance is dilatation of the vessels, which in many instances is likely to be mistaken for haemorrhage. Histologically the changes consist of cellular infiltration of the perivascular lymphatic sheaths and of certain areas of the grey matter. The lesions are most extensive in the basal nuclei of the brain, in the upper part of the pons, particularly in the grey matter of the floor of the fourth ventricle, much less prominent in the medulla; in the cord lesions are very slight or absent.

At the annual meeting of the British Medical Association held in Cambridge last year Dr. Greenfield showed a series of lantern slides illustrating the morbid anatomy of this disease. The changes found in most early fatal cases were very diffuse, and could usually be traced from the medulla to the cortex. The most constant appearances were capillary dilatation and infiltration of the brain substance with small cells of the lymphocyte type, which were often grouped round the nerve cells as though attacking them. A comparatively common feature of the disease was infarction of the brain due to thrombosis of smaller or larger arteries.

In cases of longer standing calcareous and thrombotic changes in the vessel walls were sometimes found.

Other observers draw attention to the occurrence of gross haemorrhages chiefly in the mesencephalon.

Loewe and Strauss find that the Berkefeld filtrates of brain material, nasopharyngeal swabs, and nasal washings from cases of epidemic encephalitis produce the typical lesions of the disease in rabbits and monkeys. Spinal fluid and blood are also capable of producing the disease in this way; many of the infected animals die with the typical clinical picture of lethargic encephalitis. These observers have succeeded in cultivating a minute filtrable organism, seen as clumps of minute globular bodies with Brownian movement, young cultures of which are Gram-positive. It is obtained from the brain, nasopharyngeal mucosa, cerebro-spinal fluid, and blood of cases of the disease in man and from inoculated animals dead of the disease. The organisms thus recovered from rabbits are virulent for other rabbits.

The prognosis is not good; death occurs in from 40 to 50 per cent. of cases notified, but as probably many mild or abortive cases are not recognized and not notified the true mortality is almost certainly less.

In severe cases which recover from the acute stage, sequelae, such as impairment of the higher faculties, loss of memory, defects of speech, mental lethargy, and a general loss of intellectual tone, are common. Other sequelae are the persistence of cranial nerve palsies, paresis, and even paralysis of a limb or of limbs, athetosis, myoclonus—that is, sudden shock-like spasms of limbs, sometimes also of diaphragm and larynx. In one of my cases this myoclonus is well marked fifteen months after the onset of the disease. Symptomatic paralysis agitans may be observed. Recovery from the disease is, as a rule, gradual and tedious, chiefly on account of the great prostration and muscular weakness that are so common.

Treatment.

No specific treatment is known. Hexamine, as being the most active disinfectant of the cerebro-spinal fluid, has

been largely used; it has been given by the mouth, by the rectum, and intravenously.

Lumbar puncture, repeated at intervals, has been used with some success. The intravenous injection of salvarsan has been tried in some cases and good results reported.

The French have treated many cases by fixation abscess; 1 or 2 c.cm. of oil of turpentine is injected subcutaneously into the middle part of the outer surface of the thigh. If no reaction occurs at the end of a few days, the injection is repeated. The resulting abscess is incised on the fifth or sixth day, or it may be aspirated. The pus is sterile. That this method is efficacious in the collection of toxic substances into one part of the body is shown by the following experiments. Toxic doses of arsenic in the form of sodium cacodylate were given to animals, and at the same time an experimental abscess was produced. The animals recovered from the arsenical poisoning, and a large proportion of the arsenic administered was recovered in the pus. A disadvantage of this form of treatment is that sometimes severe pain is caused. It has been used in cases of cerebro-spinal meningitis and of influenza and pneumonia. Other remedies which have been tried in lethargic encephalitis are strychnine, horse serum, and the serum of convalescents.

During convalescence the patient should be kept at rest and free from worry; sedatives and hypnotics, such as ammonium bromide and chloralamide, being prescribed, if required, in order to limit the liability of permanent cerebral lesions occurring.

Of the thirteen cases I have seen, ten were under treatment in Addenbrooke's Hospital. Most of them were of severe type, and seven died.

The following is an example of a case of average severity:

A woman, aged 24, had been in poor health for some months; in October, 1920, her tonsils were removed, and she subsequently resumed her work. About the middle of December she became sleepy and apathetic, and was troubled by vomiting in the morning. The vision became hazy, and she had difficulty in focussing. On December 21st, she complained of frontal headache and sleepiness; she was lethargic, lying with her eyes closed, but easily roused, answering questions briskly and intelligently, and then relapsing into slumber. The temperature was 103°, the tongue thickly coated, and the reflexes very sluggish; otherwise no abnormal physical signs were observed. She was admitted to Addenbrooke's Hospital on December 22nd, and for about a fortnight remained in a drowsy condition with constant headache, and mental condition slightly confused. She had partial double ptosis, misty vision, occasional diplopia, stiffness of the masseters with inability fully to open the mouth, and paresis of the facial muscles. A recurrence of vomiting and increase of headache came on three weeks after admission, but this passed off in a few days, and the condition slowly improved, so that she was discharged after five weeks in hospital. During this time she lost nearly two stone in weight. She is now making progress, but very slowly. There is still much muscular weakness, and considerable mental depression. She is gaining 1 or 2 lb. a week in weight.

The following is an example of a very severe type of case:

A woman, aged 21, consulted a doctor on December 8th, 1920, for misty and double vision. She was sent home to bed, but grew weaker and became comatose. When first seen on December 11th she was very drowsy but could be roused to answer questions, which she did in a sleepy voice, slowly, immediately relapsing into stupor. There was some fever, a crop of red papules on the chest only, double ptosis and right external strabismus, twitching of the right ala nasi, coarse tremors, and rigidity of limbs with flexibilitas cerea.

On admission to Addenbrooke's Hospital on December 11th the coma increased, and the temperature rose; it reached 105.6° in the early morning of December 16th, when the patient died.

The result of the examination of the cerebro-spinal fluid was negative; there were no pathogenic signs; there was a little excess of sugar.

In the following case myoclonus was a prominent symptom.

A woman, aged 30, attended as an out-patient on June 9th, 1920, complaining of aching in the left arm and leg, with "jumping sensations." Her illness had commenced at Christmas, 1919, with sleepiness and loss of speech lasting a fortnight. In February there was aching in the back of the neck, and later in the left side, arm, and neck. Involuntary movements of the left arm and leg now commenced and have continued ever since.

On examination the general condition was found to be good. There was tenderness about the left deltoid, the muscles of the left shoulder girdle generally were slightly wasted, and the circumference of the left calf was 1½ in. less than the right. There was no paralysis, no ocular palsies, no sensory changes, and the reflexes were present. There were jerky involuntary movements of the affected arm and leg, occurring about every two minutes. The condition suggested hemichorea.

After treatment with arsenic and bromides with but little improvement, she was admitted. Dr. Prideaux reported as follows: "I do not think there can be any doubt that this is a genuine case of myoclonus associated with encephalitis lethargica. She is certainly not a functional case, though, as in other cases of myoclonus, the spasms are increased during emotional excitement and in fatigue. The prognosis is fairly good—that is, eventually it should clear up; cases hitherto reported have cleared up in from six months to three years."

When seen on April 2nd, 1921, fifteen months after the onset of the disease, she complained of great weakness, unsteadiness of the legs, constant twitchings of the left arm and leg, and sleeplessness. Her general condition was very poor; she was pale, weak, and thin; there was some instability on walking, and especially on turning; she was apathetic and dejected, and her face expressionless; there were regular rhythmic movements of the left arm caused by clonic spasms of the muscles of the left subscapularis, and also similar movements in the left leg synchronous with the arm, caused by spasm of the hamstrings. These movements ceased at times, and were not present during sleep.

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OCULAR SYMPTOMS IN THE SLIGHTER CASES OF ENCEPHALITIS LETHARGICA.

BY

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EXETER.

THERE is a special fascination in the study of borderland cases of any disease. Moreover, to obtain a complete picture of any subject it is necessary to study its fringes. The following cases are cited as bearing upon the ocular symptoms in slight cases of lethargic encephalitis; doubtless there are other groups in which symptoms other than ocular predominate, but they would not come to an oculist.

CASE I.—*Diplopia: Paresis of Accommodation: Retrobulbar Neuritis: Drowsiness.*

C. H., aged 32, was first seen on February 11th, 1921. His illness had started three weeks earlier with diplopia for two days, and drowsiness for a week. At the beginning there was pain in the frontal region and at the root of the nose, and "weakness of the eyes," "darkness, as if a blind were drawn down." On February 11th, vision with correction was: R. 6/6, L. 6/12; loss of accommodation was: R. + 75, L. + 1. There was no diplopia present. The discs were white and filled in, the edges very well defined, the branches emerging after division suddenly out of the white disc; the main vessels were not visible. This condition was more marked in the right eye.

Fields (white object) 5/300:

	Up.	In.	Down.	Out.
Right eye	25°	20°	20°	35°
Left eye	20°	25°	22°	50°

The blind spots were not charted.

The condition on May 2nd (communicated) was:—With correction: R., 5/5; L., 5/10. Near vision with same correction: R., J. 1; L., J. 1, imperfectly; there was no diplopia, the fundi was unchanged, the general condition was much better, and work was about to be started.

CASE II.—*Diplopia: Paresis of Accommodation: Sleepiness: Weakness of Limbs: Retrobulbar Neuritis.*

Mrs. B., aged 53. Her history was as follows: On February 27th, 1921, diplopia and sleepiness began. On March 2nd, on waking, she found that she could not walk without help because of weakness of the legs. On March 11th the condition was that she had near glasses +3.5; distance glasses +2. Her vision was R. +2 = 6/12; L. +2 = 6/9 partly. The loss of accommodation was +2.5 in each (not excessive for her age, but apparently +1 more than before the attack). The irides and fundi were normal. In regard to the fields, the right eye was contracted to from 20 to 30 deg., and the blind spot enlarged (object 5/300 white). The left eye was contracted to from 15 to 20 deg.—that is, inside the blind spot (object 5/300 white). Diplopia was crossed, and was greatest in the right half of the field; that is to say, there was paresis of the left internal rectus. The limbs were weak, but the left arm and leg were weaker than the right arm and leg. The knee-jerks were equal and exaggerated. Her memory was bad. The subsequent history (communicated) was as follows: On March 29th diplopia disappeared; on April 12th vision became normal; on April 18th she was well in every respect, except for her memory, which remained very bad.

CASE III.—*Diplopia: Paresis of Accommodation: Congestion of Optic Disc: Lethargy: Delirium.*

Mr. K., aged 44 years. The history obtained was that, on February 21st, 1921, there was difficulty in reading and writing with diplopia. On February 24th he came to be tested for glasses because he found that he could read with his wife's glasses. He said he had been sleepy for the last few days. His condition was as follows: Vision: R. + 1 = 6/5 + 1.5 = J. 1 at 13 inches; L. + 1 = 6/5 partly + 1.5 = J. 1 at 13 inches. The irides were normal. The right disc of the fundi was slightly congested, the edge was sharp and there was a local swelling between the edge of the cup and the inner margin of the disc. The left disc was normal. There was diplopia, the images were uncrossed, on the same level, and separated by three degrees equal in all parts. There was paresis of divergence or spasm of convergence, but not paresis of a muscle. The subsequent history was communicated. The lethargy increased, with some delirium at night; there were involuntary tremors and general weakness, also slight paresis of one facial nerve. The temperature was 101° to 102° for five days. There was no albumin in the urine. On April 30th he had returned to business, but was still unable to read.

CASE IV.—*Diplopia; Paresis of Accommodation: Lethargy.*

Mrs. C., aged 36 years. On December 11th, 1920, she saw the tops of things double. This condition persisted for four days, but afterwards her sight was "unreliable"; she was giddy and also very shaky. She had some pain at the back of her left leg. On December 15th she was seen by her medical attendant, who found that the right pupil was larger than the left and that there was slight diplopia. On December 23rd the condition was as follows: Vision correction, R. 6/5 (6); L. 6/5 (3); the loss of accommodation R. + 1 D.; L. + 1.25 D. The irides: right pupil 3.5 mm., with very slight reaction to light and convergence; the left pupil was 2.5 mm., the reactions were normal. The diplopia was vertical, and confined to the lower right quadrant, the greatest in the lowest portion. There was paresis of the right inferior rectus. The knee-jerks were equal and exaggerated. She was pale and looked ill, but was not sleepy. Later on she became somewhat lethargic. On April 25th, 1921, she was well in all respects except that her eyes got tired after much reading, and the reactions of the right iris were sluggish.

In addition to these four cases the following may be mentioned:

CASE V.

A man, aged 52 years, seen during the later stages of recovery. There was a history of diplopia and difficulty in seeing in the earlier part of the illness. When seen there was no diplopia, and loss of accommodation was + 2.5, rather full for his age. The discs were redder than normal.

A household of four adults—husband, wife, child of 5 years, and lodger—was mentioned in a letter by the medical attendant of Case III. They were all sleepy, and each adult in turn accused the others of being cross-eyed. The lodger recovered without giving up his work as a bank clerk, although he sometimes fell asleep on his ledger, and had diplopia for all distances beyond 3 ft. from his eyes. This account of his diplopia suggests paresis of an external rectus. House groups have been described, but one consisting only of light cases must be rare.

Taking a general view, it will be seen that the cases are in the main miniatures, reproductions of severe cases on a reduced scale, rather than differing from these by the omission of certain symptoms.

Collecting the symptoms together from the various cases, the following points arise:

1. *Paresis of the ciliary muscle* is usually present, but is slight in degree and slightly different in the two eyes; from 1 D. to 1.5 D. being a usual amount. As the amount of manifest hypermetropia or presbyopia varies considerably in different patients under fairly similar conditions, it is not easy to state definitely the amount of paresis present; but in these cases the histories were fairly conclusive that there was paresis and that this was slight.

From the history it seems probable that the loss of accommodation was greatest very shortly after the onset, as was apparently the case with the diplopia, but no opportunity presented itself to verify this, for no case was seen earlier than the third day of the illness.

2. *Paresis of the iris* occurred in one eye of one case; it was of medium severity.

3. *Diplopia.*—This occurred in all the four cases given in detail, as well as in the five more casually mentioned. Three still had it when seen. Two of them had paresis of one muscle served by a branch of the third nerve, but Case II showed a relative convergence not due to paresis of a muscle, for it was equal in all positions. It is better to assume that the convergence was really due to weakened divergence than to spasm of convergence. The onset of diplopia was sudden, but it became less severe after a few days, so that Case I thought it had gone when she visited me, though this was not so. When examined there was no obvious limitation of movement in the three cases; it required examination by a light and a red glass to demonstrate it, so that this symptom was in miniature.

4. *Optic Neuritis.*—In Case II it was distinctly retrobulbar, with diminished central vision and field and enlarged blind spot. In Case I it is mainly retrobulbar, but has come forward to the disc. But there is no projection above the surface, merely a filling up of the cup, the whole disc being white. The appearance of the vessels in the right eye as they emerged from this was quite unusual, as if they suddenly appeared out of plaster-of-Paris. Case III had a slight swelling in one part of the disc. Unfortunately the fields were not taken in this case. Case V had hyperaemia of the discs. His central vision was normal; circumstances prevented the taking of his fields. Thus, in these few cases, two had definite retrobulbar optic neuritis, and there was a suspicion that Case III and Case V had a slight degree of optic neuritis. As optic neuritis has not often been recorded, it may be accidental that so large a proportion of these present cases had it, as may happen with any special symptom in a small series; but it may be that this symptom is commoner than has been suspected, the state of the patients preventing the detailed examination necessary to establish the diagnosis of retrobulbar neuritis. Or perhaps optic neuritis may be frequent in the type of this disease existing in Devon. The few cases of optic neuritis recorded in France are summarized in *Archives d'Ophtalmologie*, 1920, pp. 423 and 429.

In regard to the geographical incidence, three of these cases occurred in Exeter, the remainder in North Devon. That these cases have come under the notice of an oculist raises the suspicion that there may be others, and that slight cases of this disease may be commoner than is at present thought.

It must be pointed out that the dominant symptoms in this group of cases—paresis of accommodation, diplopia, and sleepiness — are easy to recognize. To test the accommodation exactly may require special apparatus, but if a patient has difficulty in reading come on in two or three days, and this is associated with the other two symptoms, the practitioner will not go far wrong in assuming weakness of accommodation, and in establishing a prima facie case for encephalitis lethargica, notwithstanding the pitfalls which surround the subject.

A NOTE ON NEW GROWTH AND A REDUCING SUBSTANCE IN THE BLOOD.

BY

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CAMBRIDGE.

THE theory that a factor was present in the blood which favoured the growth of certain bacteria was at one time commonly held, and was the basis of the old idea of a "diathesis," but when Ehrlich introduced his theories of immunity the older beliefs were mostly discarded and attempts to explain the incidence of disease have been greatly influenced by his teaching.

In common with several other pathologists, however, we have often felt that applications of Ehrlich's theory were limited and did not explain many of the phenomena of disease, and, while searching for further light on these problems of immunity, we tried at one time the effect of transplanting in succession each of the endocrine glands to see if any one of them by their secretions caused or accelerated the growth of tumours, and special interest attaches now to the fact that the only one that appeared to affect the growth of inoculated sarcoma in rats was the parotid.

The bacteria with filtrable spores which can be isolated from tumours have formed the subject of communications elsewhere. Finding that this class of bacteria only thrive well on media containing sugar, we examined the blood-sugar content of patients suffering from malignant disease and found the reducing substances invariably increased. (The picric acid method was used for testing the blood, hence we do not suggest that the figures given represent

only sugar, since other reducing substances may be included). Further, in most of the cases which have been under observation for any length of time a definite excretion of sugar in the urine (as tested by Nylander's fluid) has appeared from time to time. So consistent have been the results that we have recently felt able to rely on this test to differentiate between simple and malignant cases. For example:

1. A fluctuating swelling in the neck, possibly inflammatory, showed reducing substance 0.34 per cent., and proved to be sarcoma.
2. A case with long-continued gastric symptoms, possibly malignant, gave a normal sugar content, and on laparotomy showed only simple ulceration.
3. Two cases diagnosed as tubercle of the lung gave reducing substances 0.24 per cent. and 0.32 per cent. respectively. Both proved to be malignant, whereas other cases of phthisis gave a normal result.
4. A case of acute pain in the pelvis, without obvious cause, gave reducing substance 0.29 per cent., and *post mortem* an annular carcinoma of the rectum was found.

We do not wish at this stage to enter into any discussion as to the relations of the high percentage of reducing substance as cause, effect, or concomitant, but merely to relate that through finding it we were led to try the experiment of feeding rats on sugar after they had been injected with a bacillus with filtrable spores isolated from a case of human sarcoma. This sarcoma was of the melanotic type, but the pigment was scanty.

Injections were made into the tails of eight rats. Three of the animals were large enough for the emulsion to be injected into the tail vein, but in the five smaller rats the injection was subcutaneous. All external evidence of the injection had disappeared in a week, but after five weeks a nodule the size of a split pea was found at the point of injection in one of the small rats. This proved to be mainly a spindle-celled growth with a few giant cells, but some of the cells contained pigment.

One of the large rats died after six weeks and showed extensive growths in both lungs. Microscopically large areas of necrosis were seen with a margin of cells some of which contained pigment. The original sporing bacillus was regained from this growth.

Two large rats remaining alive at the end of two months were killed and found to have nodules of growth in the lungs; one also had a primary nodule in the tail.

Six rats inoculated with the same culture, but not fed on sugar, showed no evidence of growth locally or in the lungs after three months. Six other rats fed on sugar, but not inoculated with bacteria, likewise remained healthy.

In view of the interest of the subject and the fact that rats are so difficult for us to obtain, we shall be pleased to supply a subculture of this bacillus to any cancer research institute that may care to repeat our experiments on a larger scale, and we should like to suggest to those working with simple inoculable overgrowths that they try the effect of feeding the inoculated animals on sugar.

A grant toward the expenses of this investigation was received from the Science Committee of the British Medical Association.

THE PATH OF TOXINS TO THE CENTRAL NERVOUS SYSTEM.

BY

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THE statement that the infection of the central nervous system probably takes place from the mucosa of the nasopharynx is frequently made, and an examination of the possible routes of such an agent, toxin or whatever it may be, would appear to be of interest as affording a possible explanation of the sequence of phenomena commonly observed.

Two possible routes present themselves: (*a*) By the blood stream, either directly or after lymphatic absorption; (*b*) along the nerves. A consideration of the facts would seem to indicate that both routes are made use of.

In the condition encephalitis lethargica we might suppose the toxin to work its way up the motor fibrillae of the facial nerve.

The path through the cribriform plate—in spite of the fact that the nasal lymphatics have been injected from the subdural space, and the short route offered by the nasal nerves as far as the meninges and olfactory nerves through the meninges—is negatived by the fact that a toxin arriving in the anterior cerebral fossa could hardly manifest itself first by a lesion of nuclei in the tegmental region of the pons.

The facial nerve, supplying the buccinator and labial muscles in relation to the oral cavity, and probably the levator palati and musculus uvulae (lesser palatine branch of spheno-palatine ganglion, via vidian, and great superficial petrosal), in relation to the nasopharynx, could afford a mode of entrance. In the substance of the pons the ascending portion is in the closest relationship with the medial longitudinal bundle, and in all probability contributes fibres to that bundle. In addition it embraces the nucleus of the sixth nerve, in much the same manner that the loop end of a hairpin, bent on the flat, might hold a pea in its concavity.

The nucleus most intimately related to the medial longitudinal bundle is the oculo-motor, the cells of which are indeed divided by that bundle into several collections, which have been supposed to preside over separate orbital muscles. Whether the fibres for the orbicularis palpebrarum arise from the oculo-motor and descend to the facial in this bundle, as was supposed by Mendel, or whether they arise in a superior part of the facial nucleus, it is not difficult to believe that the most intimate connexion between the latter nucleus and the third is with that part of the third which presides over the levator palpebrae superioris. The trochlear and abducent nuclei are also, of course, closely placed to the same bundle.

What, then, are the symptoms we might expect from a toxin ascending by way of the facial fibrillae and medial longitudinal bundle? They are facial paralysis, ptosis, abducent or other ocular paralysis. In fact, the localizing signs commonly found in encephalitis lethargica.

MacNalty has suggested[1] that the stupor in this condition is occasioned by the cutting off of the afferent sensory stimuli, by involvement of the medial lemniscus, owing to its proximity to these medial somatic nuclei in the tegmental region.

I would submit that, in the region of the third nucleus, the medial lemniscus is pushed some distance laterally by the nucleus ruber; also that the lateral lemniscus, conveying auditory impressions, would not be involved; and that the lesions, though bilateral, are usually asymmetrical, so that one half of the sensory tract would probably be but slightly damaged. Therefore, one could hardly suppose that the afferent stimuli could be so entirely cut off as to produce the degree of lethargy observed. In fact, the type seen more approximates to that produced by drugs.

It would seem easier to explain it on the assumption that it was the general effect on the cerebrum of the toxin absorbed by the blood stream. There could hardly be doubt that toxin so absorbed would reach the cerebrum far more rapidly than it could travel up the nerves; but that it would be diluted by the total amount of blood in the circulation, come in contact with a greater amount of antibody, and would be supplied in equal amount to all the body cells. To suppose that, distributed in this way, it could pick out individual cranial nuclei would necessitate the assumption of a special affinity of certain motor cells for a particular toxin, and that such affinity was not possessed by other motor cells serially homologous and structurally identical — a hypothesis which does not commend itself.

Group 1, therefore, in which we have lethargy and asthenia but no localizing signs, might be supposed to be caused by absorption from the blood stream, in which death or recovery takes place before sufficient toxin has ascended by the nerve paths to cause such signs. The succeeding groups are those in which we have the effects of both in varying degrees.

The twelfth nucleus may be affected either by spread along its own fibrillae or from its connexion with the medial longitudinal bundle. Professor Marinesco, in the report quoted, expresses the opinion that the toxin travels by the way of the nerves. I have merely endeavoured to find an anatomical explanation for the sequence of events.

If we apply this hypothesis to the conditions met with in diphtheria, we have the causative organism living, and pouring out its toxin, on the walls of the pharynx and larynx, separated by a devitalized mucosa from muscles innervated by the cerebral part of the accessory (by way of branches of the vagus to the pharyngeal plexus). Toxins ascending along the fibrillae of these nerves would

be conducted to the nucleus ambiguus, which also contributes to the vagus motor fibres for the heart. This would explain the association of dysphagia, and regurgitation of food through the nose (paralysis of the palato-pharyngei), with cardiac disturbance—an association commonly met with in post-diphtherial paralysis.

I saw an interesting example of the association of these nerve paths in a case of paroxysmal tachycardia. The patient, in the early stages, was sometimes able to cut short the attack by the act of swallowing—a reflex action in which the nucleus ambiguus would be predominantly concerned.

Turning to the problem presented by tetanus, we find two points in which there is a contrast with the conditions previously discussed. In the first place, the effect of this toxin upon the motor cells, if indeed its effect be upon those cells, is the reverse of paralysis; it produces increased excitability with increased output. This phenomenon is more readily interpreted as due to interference with the inhibition normally imposed upon external stimuli reaching the motor cells from the sensory side; so that the paralysis probably occurs somewhere in the reflex arc, between the synaptic endings of the afferent nerves round the cells of their terminal nuclei and the dendrites of the motor cells.

Secondly, it would seem that the toxin does not ascend along the fibrillae; for if that were the case the muscles of the reflex arc, along which it travelled, would, it might be expected, be the first affected. Presumably, then, it makes its way beneath the sheath, and on reaching the spinal medulla may be supposed to ascend beneath the membranes. When it is remembered that the motor nucleus of the trigeminal nerve derives most of its sensory stimuli from the terminal nucleus of the trigeminal afferent fibres, alongside which it lies; and that the tractus spinalis comes to the surface in the postero-lateral area of the inferior part of the medulla oblongata, in the region known as the tuberculum cinereum of Rolando; and that a toxin ascending beneath the meninges might be conducted up that tract, reason can be seen for what is otherwise difficult to understand—namely, why trismus should be the earliest, and in mild cases the only, manifestation of a toxaemia which, when sufficiently prolonged, affects the whole motor mechanism.

REFERENCE.
[1] Report on Encephalitis Lethargica, Local Government Board, New Series No. 121.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

A CASE OF SUDDEN MONOCULAR DILATATION OF THE PUPIL.

THE notes on the following case afford a striking example of how a purview of all the facts in connexion with a case, both relevant and apparently irrelevant, may help towards establishing a diagnosis, and how a quite justifiable absence of knowledge of an apparently irrelevant factor may cause failure to make a diagnosis.

A medical practitioner recently sent me a lady who had suddenly developed complete dilatation of the left pupil, accompanied by supraorbital neuralgia, some apparent slight paresis of the upper lid, and some nasal catarrh.

The condition came on after a cold motor drive. It had caused the practitioner some alarm, and he, in my opinion quite rightly, regarded it as a case for investigation. The possibilities were many and various, and the condition might well have been the precursor of serious nerve lesion.

When I saw her every trace of abnormality had disappeared; the eye was normal in appearance and function, the musculature of the eye, extrinsic as well as intrinsic, acted normally; the nasal mucous membrane was healthy and normal. I was convinced that some mydriatic had got into the eye, but there was no history of any "drops" of any kind having been used. I was not satisfied, and after an examination I elicited the fact that she had a sprained knee, that she had consulted another medical practitioner about this in another town, and that she had been given a liniment to rub the knee. She did not know what the liniment was, but said that it contained "ammonia." The practitioner who sent her to me was not aware of this condition of the knee.

She told me that she had the prescription at home, and I asked her to go home and to telephone to me if it contained the word "belladonna." She rang me up in half an hour. The prescription contained belladonna, and the case was now clear. Unquestionably she had conveyed some of the liniment into her eye.

The case was not one in which I consider that I am entitled to credit, nor the practitioner who sent her to me to discredit; but I learnt a lesson and I pass it on as possibly being of value to others.

The accompanying supraorbital neuralgia, which had evidently not been severe, may have been due to the action of light (it was bright weather) on the relatively unprotected retina, and I have no doubt that the drooping of the eyelid was due to the unconscious lowering of the lid to shut off excessive light. I met the lady a few days later; there had been no further trouble.

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THE FORMOL-GEL REACTION IN SYPHILIS.

IT has been said that "the performance of the Wassermann test involves one of the most complicated methods that have been applied to diagnosis in medicine,"[1] and many laboratory workers must have hoped that some day a simpler and more direct method of diagnosing syphilis would be found.

The *formol-gel reaction* recently discovered by Gaté and Papacostas[2] gives promise of reducing the diagnosis of syphilis to a degree of simplicity altogether unexpected. The method is as follows:

One cubic centimetre of the serum to be tested is placed in a test tube, two drops of formalin (40 per cent. formaldehyde) are added and the tube is shaken to mix the contents. After standing at room temperature for twenty-four to thirty hours the tubes are examined and the results read. A positive serum is found to have coagulated into a firm jelly, while a negative serum remains fluid. Gaté and Papacostas found that, in a series of over 400 serums examined, the results corresponded with Wassermann results in 85 per cent. of cases.

I have had opportunity so far of testing only a small number of serums by this method, and the results are given in the following table.

	Formol-gel.		Wassermann.	Condition of Serum.
	Fresh Serum.	Heated Serum.		
1		+	+±	Jellied.
2		±	+±	Semi-liquid.
3	++		++	Firm jelly; tube can be inverted.
4	−		−	Liquid.
5	−		−	Liquid.
6	−		−	Liquid.
7	−		−	Liquid.
8	±		+±	Semi-liquid.
9		−	−	Liquid.
10		−	−	Liquid.
11		−	−	Liquid.
12	++	++	++	Firm jelly; tube can be inverted.
13	−	−	−	Liquid.
14	−	−	−	Liquid.
15	−	−	−	Liquid.
16	−	−	−	Liquid.
17	++	++	++	Firm jelly; tube can be inverted.
18		++	++	Firm jelly; tube can be inverted.
19	−	−	−	Liquid.
20	−	−	−	Liquid.
21	−	−	−	Liquid.
22	−	−	−	Liquid.
23	−	−	−	Liquid.

The following notes have been made during the tests:

1. The test tubes employed should be of the same internal diameter, so that the results may be strictly comparable.
2. A diameter of half an inch has been found the most suitable for use with 1 c.cm. of serum.
3. The amount of serum for a tube of this diameter should not be less than 1 c.cm. If less than this amount is used the result is obscured by capillary attraction.
4. In the case of a strongly positive serum there is definite coagulation into a firm jelly, which remains unbroken when the tube is completely inverted or even roughly handled—for example, thrown upon a table.

[1] Med. Res. Com. Spec. Report, Series No. 21.
[2] *C. R. Soc. Biologie*, November 20th, 1920.

5. A negative serum remains quite liquid, and "runs" when the tube is tilted.
6. In serums intermediate between strong positive and negative the reaction is less definite, but, generally speaking, the degree of coagulation appears to correspond to the degree of positiveness or otherwise.
7. Coagulation, when present, tends to become more marked the longer the tubes are allowed to stand—for example, a tube that was read as ± after thirty hours became a + after standing for nine days; this fact might be made use of in determining the finer grades of positive and negative.

It would be premature to form any definite conclusions on such a small series of tests, but the results obtained are sufficiently striking to show the potentialities of the method, and to give rise to the hope that this rival of the Wassermann test may lead to a simple and reliable method of diagnosing syphilis.

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Reports of Societies.

THE LARYNGOLOGICAL SUMMER MEETING.

THE Section of Laryngology of the Royal Society of Medicine held a highly successful summer meeting at the House of the Royal Society of Medicine on Thursday, June 2nd, and Friday, June 3rd, 1921. The President, Dr. JOBSON HORNE, was in the chair, and there was a very satisfactory attendance, a large number of the Scottish and provincial members of the Section being present, undeterred by the difficulties of travel at the present time, in addition to a number of distinguished foreign and colonial visitors.

The meeting was opened on Thursday afternoon by the PRESIDENT, and Mr. MARK HOVELL thereafter read a paper on the indications for and against complete tonsillectomy as a routine operation, which was followed by an interesting discussion. Mr. Mark Hovell held that enucleation of the tonsils for enlargement was unjustifiable, and, although he was supported by Professor BURGER of Amsterdam, who considered that tonsillotomy in children was better than tonsillectomy because it did not require anaesthesia, yet the other speakers were practically unanimous in favour of tonsillectomy as against tonsillotomy. Mr. ROSE, although he disagreed with the idea of leaving tonsillar tissue behind, thought the scarring after the complete operation was a great disadvantage, especially to singers; Mr. FAULDER, on the other hand, considered that singers were worse off with septic tonsils than with scars. Sir WILLIAM MILLIGAN, who thought the allegation as to scarring exaggerated, was of opinion that the complete operation was absolutely necessary, and Mr. STUART LOW agreed that if the tonsil was diseased it ought to be removed. Mr. HOLT DIGGLE stated that he had found that many tonsils which could not be diagnosed as such clinically were in fact tuberculous. Mr. O'MALLEY considered that the fear of haemorrhage ought not to weigh against the operation of tonsillectomy, as he had found that the number of cases published of haemorrhage was greater in the period when tonsillotomy was practised than in the tonsillectomy period of the last eleven or twelve years. Mr. HERBERT TILLEY said that he had passed through all the stages and he now enucleated tonsils by dissection only.

Mr. WALTER HOWARTH described the operation he practised on the frontal sinus. In the discussion which followed on the relative value of the external and the intranasal operations on the frontal sinus the merits of Mr. Howarth's contribution were acknowledged. Sir STCLAIR THOMSON, in a paper on the usual site of origin of intrinsic cancer of the larynx, said that his experience of fifty laryngo-fissures now led him to believe, contrary to his former opinion, that the usual site was the anterior and middle thirds of the vocal cords. The paper was illustrated by drawings and specimens shown on the epidiascope.

In the morning session next day the papers were mainly of technical interest. Dr. LOGAN TURNER opened with a paper on paralysis of the vocal cords in cases of malignant tumours of the mamma, and Sir WILLIAM MILLIGAN followed with an exposition of his methods of practising diathermy in inoperable pharyngeal and epilaryngeal malignancy. Dr. IRWIN MOORE'S paper on eversion of the sacculus laryngis, the so-called prolapse of the ventricle, started an animated discussion, which, however, did not obscure his thesis that the so-called prolapse was in reality an eversion of the caecal appendix called the sacculus.

Mr. HOBDAY then read an interesting contribution on the results of over 2,000 cases of vocal cord paralysis in horses treated by the stripping of Morgagni's ventricle. Mr. Hobday practised this operation for the relief of roaring and whistling horses, and he suggested that it might be useful in the treatment of bilateral paralysis in man for which at present tracheotomy was all that could be done. In the discussion that followed, however, it was remarked that the conditions in man which gave rise to bilateral paralysis were usually of such a serious and advanced nature that it was doubtful if Mr. Hobday's operation could be satisfactorily performed, while Mr. VLASTO pointed out additional difficulties in technique to which the slight anatomical differences gave rise. Mr. TILLEY probably expressed the opinion of the meeting when he said that there were certain comparatively rare conditions in which the operation might well be tried.

The last paper in the morning session was by Mr. SYME, on bronchoscopy in the treatment of asthma; in a series of 23 cases he had had in 12 alleviation of the symptoms after the application of a 10 per cent. solution of silver nitrate to the bronchi by the aid of the bronchoscope. A subsequent speaker stated that the passing of the bronchoscope into each lung without any application had been of benefit in asthma, but in his reply Mr. Syme stated that he had done so, and had also used other applications, without the benefit which silver nitrate had given.

In the afternoon a number of demonstrations were given by Dr. MORTON on some recent developments in *x*-ray treatment for laryngeal cases; by Dr. MULALLY on the technique of blood transfusion; and by Mr. LAYTON, who demonstrated some specimens from the Onodi collection. The afternoon session was followed by the ordinary clinical meeting of the Section of Laryngology, when Dr. DOUGLAS GUTHRIE showed a specimen of a collar stud which in the oesophagus of an infant had caused osteomyelitis and death. Dr. CUBLEY demonstrated new tracheotomy instruments; Sir STCLAIR THOMSON showed a number of cases of tuberculosis of the larynx in which good results had followed treatment with the galvano-cautery; and Dr. FREDERICK SPICER showed a case of laryngocele after operation, which he had previously shown last year and which gave rise to considerable discussion. Other cases were shown by Mr. JEFFERSON FAULDER, Dr. DAN MCKENZIE, Mr. O'MALLEY, and Dr. ELEANOR LOWRY. In the evening a very successful dinner was held at the Trocadero Restaurant, at which Professor Burger of Amsterdam, Sir Frank Colyer, Sir Charles Gordon-Watson and other guests were present, and on Saturday morning a number of special operations were performed at University College Hospital by Mr. Herbert Tilley and others.

An interesting ceremony in connexion with the Summer Meeting took place on Sunday, June 5th, when a number of representative laryngologists met at Wargrave to place a laurel wreath on the grave of Sir Morell Mackenzie in the churchyard there. The members of the Section and other guests were invited to lunch by Dr. Irwin Moore, who lives at the house in Wargrave which was formerly Sir Morell Mackenzie's, and thereafter they walked in procession to the churchyard, where they were met by the vicar, who held a short memorial service. The laurel wreath was placed on the grave by Mr. Mark Hovell and Dr. Donelan, both old pupils and house-surgeons of Mackenzie's, and Mr. Mark Hovell made an oration on the qualities of Sir Morell Mackenzie as a man, and told of the long battle against ill health which the great laryngologist had had, of his innumerable acts of private charity, and of his many achievements. Sir STCLAIR THOMSON then spoke of him from the professional point of view as the "father of laryngology," and said that, following Lamb's advice, whenever a new book on laryngology was published he read Mackenzie's old book, and there found many of the so-called new ideas. Sir JAMES DUNDAS GRANT also spoke, referring to the fact that a commemorative tablet had been placed on the house at Leytonstone where Morell Mackenzie was born. The villagers of Wargrave crowded into the old churchyard, and the village choir led the singing of appropriate hymns. In the background were the two surviving daughters of Morell Mackenzie, and

Mr. Gustave Garcia, son of the great Manuel Garcia, stood near. Round the grave of the pioneer of the science who had been dead for nearly thirty years were grouped, with bowed heads, most of those whose names are best known in laryngology to-day, and there, in the brilliant sunshine of the summer afternoon, the touching little ceremony ended.

CARDIAC MASSAGE.

AT a meeting of the Section of Surgery of the Royal Society of Medicine, held on June 1st, Dr. A. GOODMAN LEVY read a communication on cardiac massage. He claimed that consistently successful results—at least in the case of cats, though not in the case of dogs—had been obtained in the laboratory, and therefore the results obtained when dealing with the human subject ought to be much better than they were, even allowing for the fact that the completeness of laboratory control was not possible. Successes were recorded, but failures were so many as almost to bring the method into disfavour. The purpose of cardiac massage was to create an artificial circulation; the procedure employed was purely mechanical, and must be combined with an efficient method of artificial respiration. Success was rarely possible without this accompaniment, and to justify cardiac massage both the surgeon and the anaesthetist should be thorough in all that they did. The term "massage" was inappropriate; it was not a massage of the muscular tissues of the heart which was intended, but an effective rhythmical compression of the heart, including the expulsion of the contents of both ventricles, for he had not found his attempts successful unless the right ventricle as well as the left received attention. He discussed the various methods of access; in nearly all the successful cases pressure was applied under the diaphragm, not involving the incision of the diaphragm, as in the transdiaphragmatic method, but success had been claimed for the thoracic route also. There was no question at all as to the adequacy of massage to restore the beat of a heart overdosed with chloroform, but syncope from primary cardiac failure introduced other considerations. Not more than two minutes should be allowed for the chance of spontaneous recovery with primary cardiac syncope, and after that time massage should proceed without hesitation. A point of some importance in the procedure was intermittency. If the massage was not successful after ten minutes, the action should be intermitted by intervals of rest, from fifteen seconds increasing to forty-five seconds, and it would often be found that during the rest period or on resumption of massage following it the heart recovered. A table of times shown by Dr. Levy indicated that the duration of massage before recovery occurred was very variable, and apparently had no relation to the interval between the moment of syncope and the commencement of massage.

The lateness of the hour ruled out almost all discussion upon Dr. Levy's paper, but there was time for one member of the Section to suggest that the good results were solely due to the artificial respiration given concurrently with the massage, and would be forthcoming just the same if the massage were omitted.

THE Société Belge de Neurologie et de Psychiatrie recently celebrated its twenty-fifth anniversary at Brussels, when the subject for discussion introduced by Drs. Ley and Alexander was the psychological and anatomical study of senility.

THE forty-first annual meeting of the Ontario Medical Association was held at Niagara Falls, from May 31st to June 3rd, and the Canadian Society of Anaesthetists, the Interstate Association of Anaesthetists of America, the Ontario Radiological Society, the Canadian Radiological Society, and the Ontario Hospitals Association held meetings concurrently. Besides addresses on surgery by Dr. Starr Judd, and on medicine by Dr. Frank Billings, there were sectional meetings and discussions on medicine, surgery, obstetrics and gynaecology, radiology, ophthalmology, and oto-rhino-laryngology, and a scientific exhibit with special demonstrations. There were three dinners, at one of which the President of the Association, Dr. Heurner Mullin, spoke, and at another the President of the Trades and Labour Congress of Canada, while many other social attractions were arranged.

Reviews.

OPERATIVE SURGERY.

WE are glad to welcome the third edition of the manual of *Operative Surgery*,[1] by THOMSON and MILES, which is a companion volume to the *Manual of Surgery* by the same authors. Any disappointment with which the surgical profession received the first edition has been completely dissipated by the admirable production now before us; its scope is considerably wider than that of the first edition, and we are sure that the volume will appeal to all classes of the profession not only on its own merits but also from the fact that it may be regarded as thoroughly representative of the surgery of the Edinburgh school. The book is divided into two sections—general and regional; the former deals with surgical technique, anaesthetics, and general considerations as to amputations and operations on blood vessels, nerves, bones, and joints; the latter part is concerned with operations on the various regions. It is significant that in the chapter on anaesthetics the description of the action and mode of administration of ether takes precedence of that of chloroform, and occupies five times the number of pages. The general discussion on the various anaesthetic substances is very fair-minded, the claims of each being presented fully and adequately, with, on the whole, a preference for open ether. The up-to-dateness of the book may be realized from the introduction in the chapter dealing with transfusion of blood, of Moss's classification of blood groups. Following the plan adopted in the first edition, each chapter in the regional part of the book is preceded by a succinct anatomical description of the parts to be dealt with. This anatomical introduction is apt by some authors to be overdone, but any reader of this work will agree that the interest of the descriptions of the operations is greatly enhanced by the short anatomical sketch of the parts involved. We note with a certain measure of regret that in these anatomical descriptions the new nomenclature seems to be generally employed, though in each instance the old nomenclature appears alongside. Illustrations are plentiful but by no means redundant, and they are of high quality. A few errors in the letterpress have crept in (page 37 line 37, page 432 line 13, page 529 line 10), while the clamp shown in the picture illustrating Mitchell's operation for piles is not Mitchell's clamp but an ordinary transverse serrated forceps. These are, however, small blemishes in a most excellent work, and are indicated simply for the purposes of alteration in the next edition. The book is one which can be very heartily commended to practitioners, operating surgeons, and men preparing for a fellowship examination; its production reflects the highest credit not only on the authors but also on the publishers.

We were able to welcome the first English edition of SCHMIEDEN'S *Operative Surgery*[2] with commendatory words. The second edition is somewhat enlarged, and apparently an effort has been made to make the work less of an operative surgery class-room book and more like a volume of value to the practitioner and the surgeon. To a very great extent, however, the book remains more suitable for the student taking a course of operative surgery than for the practising surgeon. The illustrations, though well drawn, are more helpful when operating on the cadaver than on the living subject. The book appears to be popular in Germany, as six editions have already appeared. The observations in the translator's introduction are, on the whole, somewhat trite, and one has difficulty in comprehending the meaning he desires to be attached to two diagrams consisting of a series of seven black dots labelled stomach, heart, lung, etc., connected together in one instance by a dotted line and in the other by a plain

[1] *Operative Surgery*. A companion volume to a *Manual of Surgery*. Vols. I and II. By Alexis Thomson, F.R.C.S.Edin., and Alexander Miles, F.R.C.S.Edin. Third edition. London: Henry Frowde, and Hodder and Stoughton. 1920. (Cr. 8vo, pp. 637; 279 figures. 16s. net.)

[2] *The Course of Operative Surgery*. A Handbook for Practitioners and Students. By Professor Dr. Victor Schmieden, Professor of Surgery in the University of Halle, and Arthur Turnbull, M.B., Ch.B. (Glasg.) lately Demonstrator of Anatomy in the University of Glasgow. Second enlarged English edition. 1920. London: Baillière, Tindall, and Cox. (Roy. 8vo, pp. xx+350; 436 figures. 25s. net.)

line. The translator describes two cases in which mistaken diagnosis was made, and remarks that "a more scientific outlook is to regard the body as reacting as one whole to disease or infection or external changes, and to interpret particular symptoms . . . not as pointing to any one organ as the cause of the particular illness . . . but rather as the localized signs, interruptions, diminutions and exacerbations of the general condition." This, of course, is what we all know, and is constantly before the mind of every teacher. On the whole we do not think that this book approaches, in excellence or usefulness to the practitioner and student, many books on operative surgery published by British authors.

A SERUM TEST IN SYPHILIS.

DR. ARTHUR VERNES'S *Atlas de Syphilimetrie*[3] contains much that is of interest to the syphilologist and much that will require careful investigation before a definite opinion can be given of its value. The author has elaborated a special serum test for syphilis, which he claims is not only useful for diagnostic purposes, but is especially valuable as a means of controlling treatment and of verifying cure. The test is a very elaborate one, and it is impossible to furnish a complete description. Briefly stated, the basis of it is as follows: When a substance which the author calls "perethynol" (a fluid containing an infinite number of ultra-microscopic granules in suspension) is added to any human serum flocculation takes place—that is, the granules congregate into masses, microscopic at first, but later becoming visible to the naked eye. Perethynol is an ethylene perchloride and alcohol extract of horse's heart. In syphilis this flocculation is more marked and is proportional to the intensity of the infection. A single test is of little value, but by making a series of tests a curve may be formed, the curve of a syphilitic being very different from that of a normal person. The author has discovered that pig's serum is "antiflocculent," opposing the formation of granules. On the other hand, pig's serum is haemolytic for sheep's red corpuscles. What is of interest is the fact that in exercising the antiflocculent property pig's serum loses its haemolytic action. The application of this is evident. Perethynol, human serum, pig's serum, and, later, sheep's corpuscles, are added together. In proportion as the pig's serum prevents flocculation it loses its power of haemolyzing the corpuscles, so that the latter are completely, partially, or not at all haemolyzed. The degree of haemolysis is found to correspond to the intensity of the syphilis, being complete with a normal serum and almost *nil* with a powerful syphilitic one.

The results of a series of tests are recorded graphically. Injections of arsenical preparations are also found to exercise an action on the flocculating power of the blood, and Dr. Vernes claims that his reaction enables treatment to be controlled in a completely satisfactory manner.

It is difficult at the present moment to estimate the value of Dr. Vernes's observations. Up to now they have only been tested in a few laboratories in England, and much work will have to be done on the subject. The technique of the reaction appears to be somewhat difficult, and requires the services of a highly skilled pathologist. Dr. Vernes's *Atlas* is written in a lucid style, and is most excellently illustrated by means of numerous charts.

BACTERIOLOGY.

THE seventh edition of Professor HEWLETT'S well-known *Manual of Bacteriology*,[4] while preserving the general features of former editions, has been revised and brought up to date, so as to include reference to, amongst other things, the serological types of the pneumococcus, Holman's classification of streptococci and infections by paratyphoid C. The section dealing with spirochaetal infections contains an account of Noguchi's recent work on yellow fever, and some of the other sections have been revised where necessary. A full description is now given of the technique of Fildes and McIntosh for carrying out the Wassermann reaction. When a subject is developing so rapidly and on so wide a front as bacteriology, the task of writing a satisfactory textbook is particularly difficult, since an edition is no sooner published than inevitably it begins to grow rapidly out of date.

Professor Hewlett's volume is the work of a teacher of great experience; the printing and illustrations are excellent; the subject matter is well set out and the diction is extremely clear and comprehensive, so that the book is, perhaps, the most readable of all the bacteriological textbooks in English. These characters have justly gained for it a wide popularity. The following criticisms are offered in a constructive spirit. The book now runs to over 800 pages—surely some compression could be effected without materially reducing its value? On general grounds it seems a pity to label Welch's bacillus by its later Continental name of *perfringens*. While Wassermann's reaction is fully dealt with, we see no reference to the far simpler Sachs-Georgi reaction, which is making such rapid strides on the Continent as a check, if not eventually as a substitute, for the more complicated and difficult Wassermann test. Finally, we should like to see a rather more full description of the present state of knowledge concerning filtrable viruses: Lipschütz's classification of them, given in Kolle and Wassermann's *Handbuch*, is well worthy of mention in the next edition of one of the leading textbooks of bacteriology in this country.

TYPHUS FEVER IN SERBIA.

THE monograph entitled *Typhus Fever, with Particular Reference to the Serbian Epidemic*,[5] by Dr. RICHARD P. STRONG and colleagues, contains a full account of the work of the American Red Cross in connexion with the suppression of the typhus epidemic in Serbia. The book is divided into four parts. The first, which is written by Dr. Strong, contains a general account of typhus fever, with particular reference to the Serbian epidemic of 1915, followed by a description of the Polish epidemic of 1916. A vivid account is given of the deplorable conditions prevailing in Serbia shortly after the arrival of the American Red Cross. "The conditions in many of the hospitals were about as bad as they well could be. There was no lavatory or bathing or toilet facilities for the patients, no clean linen or clothing for them, and no systematic disinfection of such linen or the beds. There were usually no nurses and often only a few Austrian prisoners as attendants. . . . Under such conditions the mortality was naturally great, and reached in some instances as high as 70 per cent." As a result of the establishment of an international sanitary commission, consisting of American, British, French, Russian and Serbian representatives, the country was divided into sanitary districts, to which were attached sanitary personnel, sanitary stations and hospitals, and an active antityphus campaign was carried out. The epidemic was brought to an end by the efforts of the Serbian medical and sanitary officers and other officials and the Serbian people themselves, working with the foreign detachments. In his account of the Polish epidemic Dr. Strong declares that the antityphus campaign is not being prosecuted by the Polish Government in an energetic and satisfactory manner, and that if the world does not fight typhus in Poland it may soon have to fight it in other countries as well. The second part, which is written by Dr. SHATTUCK, is devoted to a description of his clinical observations on typhus fever in Serbia in 1915, and may be said to be the most complete account of the disease given since Murchison. Of the cases observed, 100 were studied in detail, autopsies being performed in 20 cases; 42 cases are related in full. The third, fourth and fifth parts, written by Drs. SELLARDS, ZINSSER, and HOPKINS respectively, give an account of the laboratory work carried on in Serbia. The absence of any mention in this part of the work of the Weil-Felix reaction, which plays so important a part in the laboratory diagnosis of typhus, is to be explained by the fact that in 1915 its value had not been recognized. Moreover, as Dr. Strong points out, during the severe period of the epidemic the number of patients admitted into the hospitals were so numerous that the use of any such methods would have been precluded.

[3] *Atlas de Syphilimetrie (100 Graphiques). Les Conditions Expérimentales de l'Extinction de la Syphilis.* By A. Vernes. Paris: F. Alcan. 1920. (H×7; pp 121. Fr. 35.)

[4] *A Manual of Bacteriology.* By R. Tanner Hewlett, M.D., F.R.C.P., D.P.H. Seventh edition. London: J. and A. Churchill. 1921. (Demy 8vo, pp. 817; 68 figures, 21 plates. 21s. net.)

[5] *Typhus Fever, with Particular Reference to the Serbian Epidemic.* By R. P. Strong, M.D., G. C. Shattuck, M.D., A. W. Sellards, M.D., H. Zinsser, M.D., J. G. Hopkins, M.D. Published by the American Red Cross at the Harvard University Press. 1920. (Imp. 8vo, pp. 278; 26 plates.)

Diagnosis from clinical manifestations was the only method possible under such circumstances.

The writers are to be congratulated upon having produced, not only a worthy memorial of the achievements of the American Red Cross, but also an important contribution to the medical history of the war.

DIABETES.

PROFESSOR MARCEL LABBÉ has collected his clinical lectures and papers contributed to various journals on the subject of diabetes mellitus into a volume.[6] The result is a series of chapters which do not form a very coherent whole. The main point on which the author insists is the recognition of two varieties of diabetes, which he designates *le diabète sans dénutrition* and *le diabète avec dénutrition*. The distinction between the two was formerly expressed in terms of the patients' appearance, "fat diabetics" and "thin diabetics." Professor Labbé contends that the true distinguishing feature is that in the former condition it is the carbohydrate metabolism alone that is deranged, whilst in the latter the protein metabolism is involved also. The clinical description of the disease is admirable, and illustrated by full accounts of cases with painstaking analyses of intake and output. The treatment is discussed at considerable length, but it is unfortunate that this portion of the work is not brought sufficiently up to date to include any mention of Allen's observations and suggestions.

The complications of diabetes are dealt with very fully, and there is an excellent chapter on surgery in diabetics, in which special stress is laid on the choice of anaesthetics, Spinal anaesthesia is the method to be employed for preference, but if a general anaesthetic is unavoidable, ethyl chloride is recommended. It must be admitted that on the whole the book does not advance our knowledge of the causation and prevention of diabetes very far. The records of deranged functions as manifested by abnormalities in excretion are singularly full, but these records do not shed much new light. The principal value of Professor Labbé's discussion of diabetes is to emphasize the necessity for investigation of the disturbances of protein metabolism, instead of, as in the past, concentrating attention too exclusively on the fate of carbohydrates in the body.

THE ART OF DINING.

THE selection of writings to be included in the series of Pilgrims' Books is being made with excellent judgement. The last volume we have seen, *The Art of High Health*,[7] consists of extracts from WALKER'S *Original*, and a translation of Cornaro's "Sure method of attaining a long and healthful life." Cornaro was born in Venice in 1467 and died in Padua in 1566. His treatise is well known and has a distinct place in the history of dietetics; he was probably the first to use the balance in the study of that subject, and was the advocate of a low mixed diet, consisting of 12 oz. of solid food and 14 oz. of wine a day. Walker was a London stipendiary magistrate who started a weekly paper, *The Original*, the publication of which was stopped after six months, owing to the onset of what proved to be the writer's last illness. Walker's views as to health are remarkable rather for sound common sense than originality. Cornaro apostrophized "O sacred and beneficent Moderation," and Walker was for that Goddess in all things. "Anxiety and quackery," he says, "are destructive of health, but a reasonable attention is absolutely necessary." He mentions what must be a very early instance of a line of treatment now popular, relating how a physician, called to a young lady subject to dreadful fits, "found out that her teeth were in such a state as effectually to prevent mastication; he adopted the strong measure of causing all her teeth to be drawn and a fresh set put in, from which time she completely recovered." Walker's "Aristology or the Art of Dining," which forms the second part of the volume before us, shows that while on hospitable thoughts intent he was an advocate of simplicity. Sir Henry Thompson, famous during the last quarter of the nineteenth century as a medical host, had without doubt studied Walker. Thompson had seven guests at his "octaves," and Walker wrote: "Eight I hold to be the golden number, never to be exceeded without weakening the efficacy of concentration." A dinner Walker gave at a tavern at Blackwall consisted of turtle soup with cayenne and "lemons cut in halves not in quarters," whitebait with brown bread and butter in abundance, grouse, apple fritters and jelly, ices, a good dessert, coffee and one glass of liqueur; with the soup, iced punch; with the whitebait, iced champagne; and with the grouse, claret: "I shall permit no other wines unless, perchance, a bottle or two of port if particularly wanted, as I hold variety of wines a great mistake." Such a dinner would have suited Thompson's ideas well: both he and Walker looked on dinner as an occasion for talk among guests asked, as the latter says, for some reason, "for people brought together unconnectedly had, in my opinion, better be kept separate." But Walker could be a great deal simpler than this, and would invite friends to share his dinner of herrings, hashed mutton and cranberry tart. Walker's governing idea was that, given simplicity, not necessarily divorced from elegance, the best digestives were tranquillity of mind, leisure and agreeable company. Who shall gainsay him?

[6] *Le Diabète Sucré.* By Marcel Labbé, M.D. Paris: Masson et Cie. 1920. (Med. 8vo, pp. vii+375; 8 figures. Fr.20.)

[7] *The Art of Attaining High Health, together with Aristology or the Art of Dining.* By T. Walker, M.A. London: P. Allan and Co. 1921. (Fcap. 8vo, pp. 283. 5s. net.)

NOTES ON BOOKS.

THE *Essentials of Medicine* in Lippincott's Nursing Manuals has been written by Professor C. P. EMERSON[8] for students beginning a medical course, for nurses, and for all others interested in the care of the sick, in clear and simple language, and is copiously illustrated and provided with an ample glossary. Professor Emerson is well known as the author of a good book on *Clinical Diagnosis*, and his elementary exposition of medicine for nurses and others has the essentials of success.

Mr. GORDON SAMSON'S book, *Every Man His Own Builder*,[9] first appeared in 1912, and the third edition is offered to the public at a time when housing is an urgent problem. The author is an architect, and his object is "to show how any man of normal bodily strength can at need build his own house without the aid of skilled labour." His book is written in plain language and every process is illustrated by explanatory sketches, and a wealth of plans and elevations, intended to ease the task of the amateur builder unversed in the technicalities of professional house designers and builders. In the present edition a table printed in red ink shows the increases in the cost of common building materials at the close of 1920 compared with the prices ruling in 1914.

The general medical reader will find Mr. F. W. RAYNES'S treatise on *Domestic Sanitary Engineering and Plumbing*[10] a good deal fuller and more technical than he is likely to need for ordinary professional or household purposes; but it contains much that is of interest to students of sanitary science and those engaged in public health administration. The main subjects dealt with are indicated in the subtitle; they are domestic water supplies, pump and hydraulic ram work, hydraulics generally, sanitary work, heating by low pressure, hot water systems, and external plumbing. The book is thus intended mainly for students of domestic sanitary engineering and plumbing, and for those whose business it is to design, supervise, or carry out work in this branch of engineering. It is copiously illustrated with drawings, tables, formulae, and worked examples. Chapters VI, VII, VIII, IX, and X are those that especially concern the medical sanitarian; they give a straightforward account of modern drainage work and domestic water supplies from the standpoint of the practical engineer.

[8] *Essentials of Medicine:* A Textbook of Medicine for Students beginning a Medical Course, for Nurses, and for all others interested in the Care of the Sick. By C. P. Emerson, M.D., Professor of Medicine, Indiana University. Fourth edition, revised. Philadelphia and London: J. B. Lippincott Co. 1920. (Demy 8vo, pp. 412; 117 figures. 12s. 6d. net.)

[9] *Every Man His Own Builder.* A Book for Everyone who Owns a Piece of Land. By G. G. Samson. Third edition, revised. London: Crosby Lockwood and Son. 1920. (Demy 8vo, pp. 362; 292 figures. 15s. net.)

[10] *Domestic Sanitary Engineering and Plumbing.* By F. W. Raynes. Second edition. London: Longmans, Green and Co. 1920. (Med. 8vo, pp. 487; 277 figures. 21s. net.)

THE publication of Mr. Walter Verdon's book, *Angina Pectoris*, has been transferred to Messrs. Baillière, Tindall, and Cox, of 8, Henrietta Street, Covent Garden, W.C.2.

THE COMING OF AGE OF ORAL SEPSIS.

BY

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On the occasion of which an account appeared in the JOURNAL of May 28th, p. 787, Sir Thomas Barlow kindly mentioned my earlier studies on anaemia (1887–90) and the endeavours underlying them to ascertain causes rather than find remedies. May I refer to the following, which I recall now with interest? When, after five years, I described the results (in 1890), I received a letter from a friend saying that it was all very well to describe results of observations and experiments, but what was the practical good of them? The reply I made was: "I don't know what the practical good is, but these are the facts."

The sequel, ten years later (1900), was the practical one, whose importance is now so widely recognized, to which reference was made by Sir Thomas Barlow—namely, the recognition of "Oral Sepsis" as the greatest septic infection in medicine, and of "Oral Antisepsis" as one of the most important and simplest and easiest measures for the prevention of a widespread group of maladies affecting almost every system of the body.

So far as this great practical measure is concerned, it was infinite curiosity about a piece of pigment of no earthly interest to anyone—followed up by studies and experiments lasting fifteen years—that led me to attach importance to oral sepsis as a disease factor, now recognized to be of the greatest possible practical interest to everyone. This outcome has been the greatest satisfaction of my life.

It is of the more interest to me since, as it happens, this summer "Oral Sepsis" celebrates her coming of age—the 21st anniversary of her appearance in medical literature under her new name. She made her entry very quietly, shyly, and even apologetically, her sponsor introducing her with these words:*

"That the common condition I am now about to describe should have any possible connexion with anaemia, especially with so severe and rare a form of anaemia as the one which (alone among all diseases) bears the deadly prognostic title of 'pernicious,' was something for which I was quite unprepared. But the following are the facts."

Although of good parentage—her parents being Experimental Pathology and Clinical Medicine—she had been and still remained at the age of eleven a very delicate child. To give her courage and individuality I sought for a fitting name, and gave her the name of "Oral Sepsis" ("Oral Sepsis as a Cause of Disease," BRITISH MEDICAL JOURNAL, July 28th, 1900, p. 215). My object in giving this special name was definitely to emphasize the nature and importance of the part she played in connexion with ill health.

"It is not the absence of teeth, but the presence of sepsis; it is not dental defects *per se*, but chronic septic poisoning; it is not defective mastication but effective sepsis; it is not accumulation of fermenting food débris between the teeth, but the presence of virulent streptococcal sepsis in open wounds in the gums and sockets, in the teeth and bone, that underlie the ill health so frequently associated with 'bad mouths.'"

The first reception she got was chilling enough. She was promptly called names—designated a "hypothesis" and a "theory"; even the play in which she was staged—that of "Medical Sepsis," as I termed it in 1904—was said not to exist. I recall, on the other hand, the encouraging note I received from an old friend and good physician, the late Dr. George Gibson of Edinburgh: "You have not only invented a new name, but a new disease." Soon, from 1902 onwards, the interest in oral sepsis grew steadily greater, and it has increased steadily ever since.

If the great subject of sepsis in medicine was a theory so also was the whole subject of surgical sepsis; if oral sepsis was a theory, so also was a fatty tumour. The only difference between the two was that no one knew anything about a fatty tumour except that it was a fact which could not be explained, was not preventable, and did no harm; whereas oral sepsis and the multiple ill effects which it produces were great facts of the first magnitude, which could be explained, and were largely preventable.

Since that time much about "oral sepsis" has appeared in medical literature, and an incalculable amount of oral sepsis has been removed, with incalculable benefit to the world. But an incalculable amount still remains. It still holds true, as summarized in the presidential address (July, 1910) of a physician than whom no one has wider knowledge and experience—Dr. J. Mitchell Bruce:

"Its effects are so widespread, so multiple, and frequently so grave as to make us ashamed of our previous blindness to a common source of blood infection staring us in the face all these years."

But if oral sepsis as a disease factor has thus played, and still continues to play, so important a part, we have now the satisfaction that it is playing it before a big audience; and that many "antibodies" have been formed against it in every branch of medicine, representing almost every system of the body.

To sum up: the gorge created in the landscape of medical diseases by this subject of oral sepsis in the past twenty-one years is both wide and deep; the volume of muddy waters of medical sepsis which has all along been there can now be seen crashing down it visible to all eyes. The rôle of oral sepsis in its causation has received a great volume of recognition, obscured at first by the mists created by its fall, then collecting itself into a great body of facts, till in a period of ten years (1910), and still more now after twenty-one years, it can be seen pouring itself over the "rapids" in a torrent of recognition of its importance not only as a medical but as a great national concern of health.

May I add that I have watched this result with great interest, both from a clinical and a pathological point of view? From the clinical point of view, in the course of some forty years' experience, I can recall nothing so astounding as the marvellous change in health I have seen time and again caused by the removal of obvious, glaring, but continuously overlooked conditions of oral sepsis.

But great as this interest has been, it has almost, if that were possible, been exceeded by the reflection, that so far as my own experience is concerned, it was pathology, and first of all experimental pathology, that formed the basis of my original conclusions. For it was the establishment of the first research endowment in experimental pathology in the country—namely, the John Lucas Walker Studentship in the University of Cambridge—that first gave me in 1887 the opportunity to begin the studies, remote apparently from all spheres of practical interest, that have been associated, directly or indirectly, with such extraordinarily interesting, practical, and unexpected results in the arrest and prevention of disease. So far as these studies have been connected with any of these results, credit may most fittingly be given to the far-sighted and beneficent purposes of those who, like the founder of that Studentship, endeavour to advance the healing art by facilitating investigations into its causation that might otherwise have been impossible.

* "Pernicious Anaemia," *Lancet*, January, 1900.

THE SERUM DIAGNOSIS OF SYPHILIS.

PROFESSOR DREYER'S METHOD.

On June 2nd Professor GEORGES DREYER, M.D., F.R.S., introduced by Sir ALMROTH WRIGHT, gave a lecture, in the Institute of Pathology and Research at St. Mary's Hospital, on the flocculation test for syphilis, which he has devised.

Professor DREYER began by pointing out that the Wassermann reaction, although for all practical purposes specific, was not really quantitative, so that different workers' results could not be compared numerically, and moreover it was very complicated and employed a large number of variable reagents. In attempting to do away with the necessity for the haemolytic system Herman and Perutz had used the property possessed by syphilitic serum of flocculating a saline suspension of sodium glycocholate and cholesterin. This reaction, however, had proved less sensitive than the Wassermann reaction, and also gave a fair number of false positive results. Sachs and Georgi had improved the flocculation test by using an alcoholic heart extract with cholesterin. To 0.5 c.cm. of this fluid they added 1 c.cm. of the serum to be tested diluted 1 in 10, incubated the tubes for two hours at 37° C., and then left them at room temperature for twenty hours before reading the results. This test also gave in the hands of most workers a certain number of false negative and false positive results.

Professor Dreyer then outlined the ideals to be aimed at in devising a test of this sort. These were: that the technique should be simple; that there should be one

variant only—namely, the serum to be tested; that the results should be expressible in definite units per cubic centimetre, whether absolute quantities (for example, cubic centimetres) or relative quantities (for example, drops) of the different reagents were used in the test; and finally, that the standard unit should be easily maintained and checked.

The Flocculation Test.

The lecturer then detailed the reagents and apparatus required for his test. These were as follows:

An alcoholic extract of calf's heart prepared in a definite and simple manner, which he described. This solution keeps perfectly for at least two years, at room temperature, in the dark.
A 1 per cent. solution of pure cholesterin in absolute alcohol.
The serum to be tested. Sterile 0.9 per cent. saline.
Agglutination tubes and stands.
Pipettes and water-baths.
An apparatus, consisting of a floating siphon, for delivering drops of saline at a definite rate.
A shaded electric light and a 6 magnification hand lens.

An essential feature of the test is the method of preparing the saline suspension of the heart-extract-cholesterin mixture, so that it is the same on all occasions and when made by different workers.

Five c.cm. of the heart extract and 0.25 c.cm. of the cholesterin solution are measured into a clean dry tube and mixed; 1 c.cm. of this mixture is placed at the bottom of a 100 c.cm. measuring cylinder. Sterile normal saline is then allowed to fall from the dropping apparatus a distance of 36 cm. on to the surface of the liquid in the cylinder at such a rate that 34 c.cm. are delivered in 4 mins. 30 secs.
Two suspensions are prepared in this manner, namely:

α. One c.cm. of the heart-cholesterin mixture into which are dropped 10.7 c.cm. of saline.
β. One c.cm. of the heart-cholesterin mixture into which are dropped 34 c.cm. of saline.

The test is then set up, using the two suspensions α and β and different dilutions of serum as shown in the following table.

No. of Tube.	Drops of Saline Solution.	Drops of Serum Diluted 1 : 1. 1 : 20.		Drops of Suspension.	Total Dilution in which the Serum Acts.
1	0	20	1 : 1	6 α suspension	1 : 1.25
2	0	10	1 : 1	15 β suspension	1 : 2.5
3	5	5	1 : 1	15 „	1 : 5.2
4	8	2	1 : 1	15 „	1 : 13.1
5	9	1	1 : 1	15 „	1 : 26.4
6	0	10	1 : 20	15 „	1 : 46
7	5	5	1 : 20	15 „	1 : 92
8	8	2	1 : 20	15 „	1 : 232
9	9	1	1 : 20	15 „	1 : 462

The dilutions in the last column are calculated with allowance for the difference in size of the drops of the three reagents. After the test is set up the tubes are incubated for seven hours in a water-bath at 37° C. The results must be read by artificial light—for example, an electric bulb with an opaque shade so arranged that the light falls on the tubes but not on the observer's eye.

The lecturer then described the different degrees of flocculation observable—namely, Total (t.), Standard (s.), Trace (tr.), and Nil (0) with their intermediate degrees.

"Standard" flocculation can readily be seen with the naked eye; the fine flocculi are evenly distributed, of uniform size and definitely separated from one another. "Trace" is the term applied to very fine flocculation not certainly visible to the normal eye, but readily seen with the 6× hand lens.

The result is expressed in what Professor Dreyer has called Sigma (Σ) units. The standard Σ unit is an arbitrary unit arrived at as follows: The amount of serum which when made up to 1 c.cm. with normal saline causes "standard" flocculation on being mixed with 1.5 c.cm. of a particular β suspension and kept at 37° C. for seven hours is said to contain four Σ units. To find the strength of a serum in Σ units one must multiply the dilution in which "standard" flocculation occurs by the suspension factor of the particular suspension.

Professor Dreyer then showed tables by reference to which the strength of a serum in Σ units could be computed when the "suspension factor" of the particular suspension in use was known. He mentioned the following precautions which must be observed:

A negative result in an contaminated serum could be trusted.
A positive result in an contaminated serum could not be accepted, and the test must be repeated with another specimen.
No antiseptics were permissible in any of the reagents.
Haemolysis of the blood to be tested, if due to mechanical shaking in transit, did not matter; if due to alcohol or ether in the syringe with which the blood was collected it upset the reaction, though to a less extent than the Wassermann reaction.
All vessels must be scrupulously clean.

The incubation period must not exceed seven hours, owing to increased danger of false positives from contamination of the serums. Water in the water-bath should not reach more than 1/2 or 2/3 the height of the liquid in the tubes. If it stood higher convection currents in the tubes were less effective, and the results were not clean cut.

Results were to be interpreted as follows. In cases with no definite history of syphilis—

Less than 1 Σ unit, negative.
Four units and over, positive. If between 1 and 4 units, test should be repeated in case mild degree of contamination of the serum had been overlooked. If result again between 1 and 4 units, positive.

In cases with a definite history of syphilis—

Less than one unit, negative; more than 1 unit, positive.
Cerebro-spinal fluid, whatever the history, less than 1 unit, negative; more than 1 unit, positive.

Professor Dreyer then gave the following results of his test in comparison with the Wassermann reaction:

Cases.	Wassermann Reaction.	Σ Reaction.	
686	Negative	Negative	
322	Positive	Positive	
59	Negative	Positive	Definite history or evidence of syphilis.
5	Positive	Negative	
4	Positive	Negative	No definite history or evidence of syphilis.
1	Negative	Positive	

Theory of the Wassermann and Σ Reactions.

The lecturer then went into the theory of the Wassermann and Σ reactions. He came to the conclusion that there were probably two substances involved in the Wassermann reaction—a thermolabile present in all serums, and a thermostable present only in syphilitic serums. The destruction of the thermolabile substance accounted for the weakening of the Wassermann reaction often witnessed after heating the serum.

He thought that most probably the thermostable substance caused the flocculation in the Σ and Sachs-Georgi reactions, and that the thermolabile substance was responsible for the inhibition of flocculation sometimes seen in the higher concentrations, without, however, in his reaction, affecting the end titre of the serum. It was probably the occurrence of inhibition which spoilt the Sachs-Georgi reaction.

Professor Dreyer ended with the following conclusions:

1. That the reaction described had yielded results which compared favourably with those given by the Wassermann reaction.
2. That the results are quantitative as well as qualitative.
3. That the reaction can be standardized and different workers' results directly compared.
4. That the effect of treatment in a case of syphilis can be followed in a change in the unit content of the serum.
5. That consequently different methods of treatment can perhaps be compared by their effect on the Σ reaction.

ACCORDING to the New York *Medical Record*, telephone exchanges for physicians have been installed at Des Moines, St. Louis, and St. Josephs, while Sioux City is shortly to have a similar system. The service is described as follows: When an emergency arises and the person wishes to locate his family doctor who is a member of the exchange either at his consulting room or his residence, by referring to the telephone book he finds the note "If no answer call No. —," and the exchange immediately gets in touch with the doctor wanted either by telephone or messenger.

VENEREAL DISEASES.

THE POLICY OF THE GOVERNMENT.

THE following communication, dated June 2nd, 1921, has been received from the Ministry of Health:

A circular dealing with the prevention and treatment of venereal diseases has been sent to all county and county borough authorities in England and Wales. The general conclusion of the Interdepartmental Committee which considered the question in the light of the experience gained during the war was that although certain drugs, properly and skilfully applied, may be efficacious in preventing venereal disease, the most carefully organized system for the supply of these drugs in "packets," and the instruction of soldiers as to their use, did not produce such a general reduction in the incidence of the disease as to warrant their recommendation for general use by the civilian population. It was, moreover, found that where preventive treatment by a skilled attendant was provided, after exposure to the risk of infection, the results were better than when the same measures were taken by the individual concerned, even though he had received the most careful instruction.

Official Advice.

The Government have given careful consideration to the views of the official Interdepartmental Committee, and the unofficial subcommittee of the National Birth-Rate Commission recently published, and find that there is general agreement that the best way to avoid risk of venereal disease is to abstain from promiscuous sexual intercourse, and that disinfection immediately after exposure to risk of infection is effective only to the extent to which it can be thoroughly applied in the particular case. They find that medical opinion is divided as to the practicability and likelihood of the success of self-disinfection by the civil population, whereas on the moral and social side most weighty objections have been advanced against it. In the circumstances the Government have decided that, whatever the individual or groups of individuals may practise or recommend, they cannot make a system of self-disinfection for the civil community part of their official policy.

On the other hand, the Government have decided to suggest the advisability of local authorities undertaking public instruction and enlightenment as to the dangers arising from promiscuous sexual intercourse and the disastrous consequences on the general health of the community which result from the spread of these diseases. They say: (1) These diseases are usually contracted through promiscuous sexual intercourse, and the best way to avoid risk is to avoid such intercourse. It is the duty of all individuals who have incurred, or think they have incurred, the risk of contracting disease to cleanse themselves thoroughly and immediately, and thereby diminish the risk. (2) If any signs or symptoms of disease, however slight, are experienced, the individual should promptly seek medical advice or attend a venereal diseases clinic; for any attempt at self-treatment of these diseases is likely to be disastrous.

The circular also clears up one or two doubtful points as to the continuance of experimental ablution centres, and as to the legal position of a chemist selling disinfectants against venereal diseases so long as the substances are not sold accompanied by any printed or written recommendations as to their use. It is hoped that this clear statement on behalf of the Government may form a useful basis for united co-operation of persons and societies concerned in the campaign against venereal diseases.

The Circular (No. 202) issued by the Ministry of Health is dated May 31st, 1921, and signed by Sir W. A. Robinson, Secretary. It runs as follows:

Prevention and Treatment of Venereal Diseases.

1. I am directed by the Minister of Health to state that the Government have had under consideration the policy hitherto adopted in this country for dealing with venereal diseases, and the question whether any modification of that policy is required at the present time.

2. As the Council are aware, the national scheme for the prevention and treatment of these diseases is based upon the recommendations contained in the final report of the Royal Commission on Venereal Diseases. The main recommendations of the Commission were—

(1) That gratuitous treatment for persons suffering from these diseases should be provided at hospitals and other institutions in all parts of the country.

(2) That a widespread campaign of publicity and education as to the dangers and effects of these diseases, and as to the necessity for early and skilled treatment, should be undertaken.

These recommendations have been and are being carried out under schemes formulated by the Councils and approved by the Minister of Health or his predecessors, while the propaganda campaign, in accordance with the recommendation of the Royal Commission, has been directed, centrally by the National Council for Combating Venereal Diseases, under the supervision of this Department, and locally by the county and county borough councils, a large number of which have co-operated with the local branches of the National Council in carrying out measures of publicity and education. In a few areas, also, Ablution or Disinfecting Centres have recently been instituted as an experimental measure in order that facilities may be provided for the disinfection, by skilled attendants acting under medical supervision, of persons who have exposed themselves to the risk of infection with these diseases.

3. The experience gained during the war by different armies in attempting to prevent the spread of venereal diseases has given rise to question whether, in the case of the civilian community, some further measures should not be adopted with a view to diminishing the incidence of these diseases, and after the conclusion of hostilities this question was considered by an Interdepartmental Committee appointed by the Minister of Health. This Committee came to the general conclusion that although certain drugs, if properly and skilfully applied, are efficacious in preventing venereal diseases, the most carefully organized system for the supply of these drugs in "packets" and the instruction of men as to their use, did not produce such a general reduction in the incidence of these diseases as to warrant its recommendation by the Government. It was, however, found that where preventive treatment was provided, after exposure to the risk of infection, by a skilled attendant, the results were better than when the same measures were taken by the individual affected, even after the most careful instruction. Unofficially also this question has recently been under consideration by a Special Committee of the National Birth-Rate Commission, and the conclusions of that Committee are contained in a report which has now been published.

4. The Government have given careful consideration to the question on which the views of these two committees, official and unofficial, are not completely in accord—namely, the question of self-disinfection—but they find that there is general agreement on the following conclusions:

(i) That the best way to avoid risk of venereal disease is to abstain from promiscuous sexual intercourse, and that a steady and continuous policy of public enlightenment on this point, and as to the risks of venereal disease and its resulting consequences on the general health of the community, is essential.

(ii) That disinfection immediately after exposure to risk of infection is effective only to the extent to which it can be thoroughly and intelligently applied in the particular case.

They also find that medical opinion is divided on the question of the efficacy of self-disinfection for the civilian population, and in particular on such questions as (1) whether it is practicable to give such instruction to the population generally as will ensure that the disinfectants are thoroughly and skilfully applied; (2) whether the spreading of knowledge as to the efficacy of disinfectants would not lead to persons running the risk of infection who would otherwise avoid that risk, and thus increase the spread of disease; and (3) whether the disinfectants will not be used in some cases for the treatment of developed disease, with the result that proper treatment will be delayed and the cure of the disease rendered more difficult and uncertain.

5. The actual situation which confronts the Government is that there is not unanimity of opinion on the medical side as to the practicability and likelihood of success of self-disinfection for the civil population, whereas on the moral and social side most weighty objections are advanced against it. It is clear that this question is one which cannot be decided solely by reference to medical opinion—moral and social considerations of very great importance are involved in it. In the circumstances the Government have decided that they cannot give official support to self-disinfection as a policy.

6. The decision of the Government emphasizes the importance, in the interests not only of the individuals concerned, but also in those of the community in general, of continuing and extending public instruction and enlightenment as to the dangers arising from promiscuous sexual intercourse, and the disastrous consequences on the general health of the community which result from the spread of venereal diseases. The Minister is aware that in most parts of the country a wisely directed campaign has been, and is being, carried on in this direction, and he is advised that it is essential that no opportunity should be lost of educating public opinion on this matter. It is important that the Council should call to their aid every

available agency in their area which exists for the purpose of the moral and social betterment of the people, and the assistance of voluntary organizations of this kind should be most valuable in advising as to the lines on which a campaign of publicity and education can best be directed and as to the contents of such leaflets, posters, etc., as the Council may issue.

It is essential that due economy should be exercised in this matter as in all other public services at the present time, but the Minister trusts that the Council will not curtail their expenditure during the current financial year on educational and propaganda work in connexion with these diseases, and he is prepared, as indicated in paragraph (6) of Circular 192, to consider applications for his approval of limited expenditure for this purpose in excess of that incurred by the Council during the past financial year. This is a matter also in which the Council would be justified in looking to voluntary bodies for some financial assistance.

7. The question of the contents of any publications which may be issued by the Council on this subject is one for the decision, in the first instance, of the Council, but the Minister desires to suggest the advisability of the widespread issue of leaflets, etc., warning the public of the dangers of venereal diseases and containing advice on the following lines:

(1) The prevalence of venereal diseases is a grave source of danger and ill health to the public.

(2) These diseases are usually contracted through promiscuous sexual intercourse, and the best way to avoid risk is to avoid such intercourse. It is the duty of all individuals who have incurred, or think they have incurred, the risk of contracting disease, to cleanse themselves thoroughly and immediately, and thereby diminish the risk.

(3) If any signs or symptoms of disease, however slight, are experienced the individual should promptly seek medical advice or attend a Venereal Diseases Clinic.

(4) Any attempt at self-treatment of these diseases is likely to be disastrous.

8. The Minister is of opinion that the arguments which have influenced H.M. Government in deciding against any official advocacy of self-disinfection do not apply to the provision of Ablution Centres where facilities are provided, with proper safeguards, for disinfection by skilled attendants acting under medical supervision.

The experience so far obtained is not sufficient to enable any final conclusions to be drawn as to whether such Ablution Centres should be established permanently in large towns; but the evidence available as to the results obtained in different armies from the provision of these centres justifies further experiments of the same kind for the civilian population, and the Minister is accordingly prepared to consider applications for his approval of the experimental provision of further Ablution Centres.

9. It is understood that questions have arisen as to the precise effect of section 2 (2) of the Venereal Disease Act, 1917, and the Minister considers it desirable to state that, although he is not empowered to give an authoritative interpretation of the provisions of any Act of Parliament, he is advised that a chemist does not commit an offence by selling any substances for which he is asked, merely because those substances are capable of being used as disinfectants against venereal diseases, so long as the substances are not sold accompanied by any written or printed recommendations or instructions as to use. It should be carefully borne in mind that by sections 1 and 2 (1) of the same Act, an offence is committed by any person (other than a duly qualified medical practitioner) who for reward direct or indirect, treats, prescribes for, or offers advice in connexion with the treatment of venereal disease, and by any person who does any of these things or even offers to do them, by advertisement, public notice, or announcement.

SOCIETY FOR THE PREVENTION OF VENEREAL DISEASE.

THE annual general meeting of the Society for the Prevention of Venereal Disease was held at the house of the Royal Society of Medicine on June 6th, under the presidency of Lord WILLOUGHBY DE BROKE. The report of the year's work, read by Dr. WANSEY BAYLY, the Secretary, recorded that the society's efforts had been concentrated upon organizing that mass of public opinion which it believed to support its policy. These efforts had taken the form of press propaganda, addresses to trade union and other organizations, debates and conferences, and the circularization of members of public bodies. The number of county and borough councils which had adopted the society's policy had increased from twelve to twenty. A branch had been formed in New Zealand, one was projected in South Africa, and propaganda was proceeding in Canada and in Jamaica. The report of the Birth-Rate Commission in its medical aspects was claimed as an endorsement of the society's policy. The treasurer's report revealed a total income for the year of £922, and an expenditure of £878.

Lord WILLOUGHBY DE BROKE said that venereal infection still constituted a grave danger to the public welfare, in spite of the official policy, which consisted of exhortations to be chaste, warnings against the danger of unchastity, and advice to the incontinent to go to the doctor on becoming infected. All these were essential in dealing with the problem, but they were demonstrably insufficient. Two further lines of action were possible: one consisted of disciplinary methods, such as compulsory notification and detention, but these measures were highly contentious, and in any case would involve legislation and consequent delay. The other line of action was the provision of means of immediate self-disinfection, and this was the society's policy. Recently the Ministry of Health had issued a circular to the county and borough councils in which it was stated—

"It is the duty of all individuals who have incurred or think they have incurred the risk of contracting disease to cleanse themselves thoroughly and immediately, and thereby diminish the risk."

That, with the substitution of the word "disinfect" for "cleanse," might have been written from the offices of the society. The society had endeavoured to persuade the Ministry of Health to alter the Act of 1917 by allowing chemists to sell recommended disinfectants under the Government's imprimatur, but the Minister had stated that there were moral and social considerations to be taken into account before self-disinfection could be embraced as a policy. In face of the admission he had just quoted the society should now approach the Ministry with a view to removing the disability of chemists, and should assert itself as the proper body to take the risk and responsibility of issuing instructions and recommending disinfectants. He moved:

That the Society for the Prevention of Venereal Disease take immediate steps to apply formally to the Ministry of Health for their sanction, under the Venereal Disease Act, 1917, of the preparation and sale by chemists, under the supervision and control of the Society for the Prevention of Venereal Disease, of the materials for immediate self-disinfection recommended by them.

Lady ASKWITH seconded the resolution, and it was carried unanimously.

Sir FREDERICK MOTT supported the society's policy, because he believed it to be the only one which could effectively combat the disease. Human nature was not going to be changed at once by moral persuasion, especially having regard to the psychological disharmony prevailing at present in social life. It was said on the Birth-Rate Commission, by those who supported the policy of the National Council, that self-disinfection in the army had not produced the happy results expected. But any method of self-disinfection must be efficiently carried out, with strict observance of the regulations and instructions. When disinfection was carried out under proper conditions—as Sir Archdall Reid had shown at Portsmouth—the success was phenomenal. The early ablution centres of the Government were not materializing. One was in existence (at Manchester) and five were in prospect, but there were 183 curative treatment centres, and therefore there should be 183 areas in which prophylaxis was necessary. Nor would these centres be likely to multiply, because the ratepayers objected to this burden. The society's policy of immediate self-disinfection was therefore called for, and in order that it might be efficient there must be the means of obtaining the disinfectants, and the proper instructions for their use, without trouble.

Dr. J. H. SEQUEIRA said that the upholders of the official policy appeared to rejoice in the increased numbers attending the clinics, whereas a matter for congratulation would rather be diminished numbers at the clinics and a larger proportion of those who had been foolish enough to risk contagion seeking the means of self-disinfection.

Other speakers were Lieut.-General Sir FRANCIS LLOYD, who commented on the unwillingness of public bodies to face the situation; Miss NORAH MARCH, who described propaganda among women's organizations; Rev. HUGH CHAPMAN, the only clergyman as yet officially connected with the society; and Miss ETTIE ROUT, who gave reasons for the failure of self-disinfection in the Rhine army. These reasons were chiefly that the prophylactic system in its direction from London was weak and timid and the outfit out-of-date; there was great laxity and half-heartedness among many of the field officers; officers who permitted a high rate of infection to arise or continue in their ranks were not demobilized, and soldiers who contracted the disease were not punished sufficiently to deter them or to make them particularly anxious for self-disinfection.

The officers and members of the Executive Committee of the society were re-elected.

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A NEW STUDY OF APHASIA.

I.

DR. HENRY HEAD in his Hughlings Jackson Lecture for 1920[1] reviewed the subject of aphasia from the historical standpoint. His Linacre Lecture[2] had dealt with the clinical aspects of disorders of speech. The two lectures are inseparable, and in order to appreciate the importance of Dr. Head's suggestions, the Hughlings Jackson Lecture claims our first consideration.

In the past many hypotheses as to the cerebral localization of speech have been accepted which were neither provable nor useful. In the Middle Ages the brain was supposed to contain three ventricles, of which the anterior was the seat of sensation, the middle that of cogitation and reasoning, whilst the posterior was assigned to memory. Descartes and the philosophers of the seventeenth and eighteenth centuries swept away the materialism of the schoolmen, with the result that no one presumed to correlate directly the activities of the mind with the life of the brain. Gall was the first to insist that the intellectual processes of the mind were materially bound up with the integrity of the brain. His attempts to localize mental functions and moral faculties in the brain were based on the observed effects of injuries; and, although his conclusions may have been fantastic, there was sense in his plea for examination of the brain from the spinal cord upwards. In 1861 Broca described a definite clinical condition which he called "aphemia," produced by destruction of brain substance, and he believed that he had found the faculty of articulated language in the third frontal convolution. Interest in the question of the localization of speech rapidly spread to England, and in 1864 Hughlings Jackson published his first paper on "Loss of speech, with hemiplegia of the left side." Broca and Jackson took part in a discussion on aphasia at the British Association in 1868, so that their views can be readily compared.

The clinical observations of Broca were clear and precise. He recognized two main groups of speechless patients. First, the "aphemic," who has a reduced vocabulary and may be speechless except for a few monosyllables which do not seem to belong to any language. Yet his ideas appear to be intact, he can understand what is said to him, and he recognizes words and phrases which he cannot repeat. The "amnesic" patient, on the other hand, can pronounce words, but they have no bearing on the ideas he wishes to express. He has not lost all kinds of memory, but he no longer recognizes the conventional association between ideas and words either spoken or written. Up to this point Dr. Head admits that Broca's statements are consistent with fact. But the larger number of cases do not correspond with these two clean-cut divisions, and this hampered the determination of the localization of the lesion. Broca himself insisted that it is aphemia only which is caused by a lesion of the third frontal convolution.

[1] *Brain*, vol. xliii, p. 390.
[2] Ibid., Part 2, vol. xliii, p. 87. See also Head, "Disorders of Symbolic Thinking and Expression," *British Journal of Psychology* (General Section), vol. xi, Part 2, p. 179.

Hughlings Jackson, on the other hand, contemplated a bolder and wider conception of speech and its disorders. He failed to command the attention of the medical world, either at that time or later, because he declined artificially to simplify problems which he realized to be intricate and immensely difficult. Jackson did not shrink from approaching the subject from the psychological as well as from the anatomical side, and psychology was in those days considered utterly remote from clinical medicine. He pointed out that healthy language consisted of two distinct but usually inseparable forms: (1) Intellectual—that is, the power to convey propositions; (2) emotional—the ability to exhibit states of feeling. These two are separated by disease. In most cases it is intellectual language which suffers; emotional language usually escapes. The power to form propositions is affected, and not the memory of words or faculty of language. The higher the propositional value of the task the patient is asked to carry out the less he will be able to respond, whereas the lower or more automatic the task the easier will it be to perform. This is the basis of Hughlings Jackson's treatment of disorders of speech.

The temptation to appear simple even at the expense of accuracy was, however, too great for Jackson's contemporaries. They were fascinated by diagrams which could be memorized without necessarily understanding the problem involved. Bastian, Baginsky, Wernicke, and Lichtheim headed a veritable school of "diagrammatists," who, as Head says, "were compelled to lop and twist the clinical facts to fit the Procrustean bed of their hypothetical conceptions." Nevertheless they held the field almost unchallenged until, in 1906, Pierre Marie startled the medical world by a pronouncement which Mott described as "an earthquake to our cherished beliefs in cerebral localization." Marie asserted that the third frontal convolution does not play any special part in the function of language, and that "sensory" aphasia could no longer be accepted. Marie's views led to heated discussions on such terms as "Broca's aphasia," "total aphasia," "word-blindness," and "word-deafness," which, Head remarks, are pure phrases not corresponding to any clinical phenomena. Marie claimed that Broca's aphasia was always accompanied by a marked diminution in the general intelligence, that it was not a special loss of word memories, but a defect partly of general intelligence and partly of special intelligence of language. Jackson had appreciated this long before and had gone much further towards analysing the intellectual defects involved. But his writings were forgotten or remained unread. They bristled with difficulties, and lacked the fluent dogmatism of his contemporaries.

The summary of Hughlings Jackson's views given by Dr. Head may be condensed as follows:—(1) Aphasic patients may be divided into two groups: in Class A the patient is almost speechless, though he may utter one or two unvarying words or jargon; Class B comprises those who have plentiful words but habitually use them wrongly. (2) Loss of power to carry out an order depends on the complexity of the task; the more abstract the conception, the more difficult its execution. (3) Higher and more voluntary aspects of speech suffer more than lower and automatic; hence emotional and impulsive utterances may be retained. (4) Writing is affected not as a separate "faculty," but as part of the failure to propositionize in words. (5) Defects in reading are not due to some loss of function called "alexia," but to an inability to reproduce a proposition which may none the less be received accurately. (6) Imperception

is on the receptive side what "aphasia" is on the emissive. Defects of speech are caused on the emissive side by inability to form or express a proposition in words; on the receptive by failure of those mental processes which underlie perceptional recognition. (7) External and internal speech are identical, except that the former is exhibited in the utterance of articulated words, whilst the latter can be discovered by writing only. (8) External and internal speech depend upon the formulation of a proposition which can be verbalized in speech or writing. If the patient cannot formulate to himself and retain a sequence of abstract propositions, the emissive aspect of speech will be affected. (9) If to this defect is added "imperception," the patient will show impaired comprehension as well as impaired speech. (10) In the majority of cases with defects of speech mental images are unaffected, notwithstanding that almost every hypothesis propounded in the last forty years presupposes some defect in auditory or visual word images.

Thus it is evident that the teaching of Head no less than that of Hughlings Jackson brings us back for our starting point to Locke's view of language—namely, the use of articulate sounds as marks or signs of ideas within a man's own mind whereby they may be made known to others and the thoughts of men's minds be conveyed from one to another. We propose to indicate some of the consequences of this doctrine in another article.

THE AMERICAN UNIVERSITY.

AFTER the London Conference of all the Universities of the Empire in 1919 the Administrative Committee of the Australian universities felt that an era of greatly extended and improved relationship between the universities of the world had begun, and that, if Australia were to keep its place among them, more must be known of the highly important American group. Accordingly, the chairman of the Administrative Committee spent three months in America, and, without any idea of publication, wrote a report designed to furnish the Australian universities with answers to certain questions concerning the American universities. At the wish of the University of Sydney, Professor E. R. Holme has now published part of this attractively written report,[1] which he modestly describes as a preliminary survey of a very wide field, and as but the first impression of a very large subject. Some account of what he has to say will, we believe, be of interest to many readers in this country.

The typical American university is in a period of transition to an improved method of government and administration. The numbers of students have increased since the war, though (probably from the protection exercised by restriction of entry) there is no parallel to the fourfold increase of students reported at Liverpool. A fundamental difference between the American universities and those at Oxford, Cambridge, in Scotland and in Australia is that the former continue to be responsible for a very great amount of secondary education, such as is carried out by our public schools; the reason for this is that the period of four years of American high school education, intended to cover the pupil's school time from his 14th to his 18th year, is not long enough; and one result is that a well-trained American student graduates in medicine two years later than a well-trained European. The American school system, copied from Prussia, is not one for imitation in Australia, which directly inherited the British scheme—one regarded as providing a good sound basis for development. The matriculation requirements naturally vary among the different universities, but entrance by leaving certificate or high school graduation diploma is one of the essentials. If the university could enforce a proper entrance standard in appropriate subjects, much benefit would accrue to secondary education; there appears, however, to be considerable risk that the influence may work in the opposite direction and that the university entrance standard may be pulled down to the low average level of high school training in schools that have little need to prepare students for universities. There is indeed too much competition for students among American universities, and this naturally exerts an influence adverse to the maintenance of matriculation standards. Nevertheless it is remarkable how good both in quality and quantity is the work accomplished by the American university upon the insufficient and unsafe basis of American public secondary education; it trains its undergraduates to be university men and women all their lives, and by means of associations of alumni (fraternities) and alumnae (sororities) and of publications keeps them mindful of the obligations of academic citizenship. This "class" system—a characteristic American tradition—keeps fellow students permanently in touch, and there is no doubt about the vast and beneficent influence exerted by the universities on American society.

American universities have suffered from the example set by modern competitive methods in business; for a university is not a mercantile venture, and the autocratic powers vested in the president of a university, to whom there is no corresponding official in British universities, undoubtedly has potentialities for harm. There is also, perhaps, too much administrative machinery in American universities, and the attraction of able men out of professorships into administrative posts by apparently higher positions and actually better emoluments is a bad policy. Out of 150 institutions styling themselves universities forty are State universities, and being therefore more generously supported are thus able to supply the deficit not met by the students' fees. The future of the American university should be predominantly on these lines, for, though they are more exposed than endowed universities, such as Harvard, Yale, Princeton, and the Johns Hopkins, to popular influence which might force them to derogate from the higher ideals of a university, it does not appear to be a sound criticism that they are more utilitarian in their motives, for all universities are much concerned with utilitarian purposes, and through the ages have given professional training—for example, in medicine. But the State universities obviously cannot specialize in divinity, and are less impeded than the old endowed universities in making a speciality of the modern sciences and the mechanical arts. In accordance with the Land-Grant Acts, the first in 1862 being known as the Morrill Acts, Congress has allotted to State universities, and for their foundation in States without universities, grants of land. This federal aid to universities is under the general supervision of the Federal Bureau of Education, which is a section of the Department of the Interior. It is rather remarkable that there is not in the United States a university that is a federal institution, and therefore national in the specific sense, especially as George Washington urged the foundation of such a university and left a bequest for its endowment.

[1] *The American University: An Australian View.* By E. R. Holme, Professor of English Literature in the University of Sydney. Sydney: Angus and Robertson, Ltd. 1920. (Cr. 8vo, pp. 242. 7s. 6d.)

The really typical American graduate university justly has a high reputation; thus Harvard is famous among all English-speaking peoples in law, and is rising as high in medicine, though in this respect the Johns Hopkins, with distinctions in many other subjects—of which some, such as political economy, are comparatively recent—is perhaps better known. The new development of the University of Minnesota in connexion with the Mayo foundation is rightly mentioned here. It appears that the separation of undergraduate from graduate work has now gone far enough in America. Professor Holme considers that the separate undergraduate university for women is one of the most valuable of the American contributions to higher education, and he refers to the voice recently raised in prayer in this country for at least one women's university and at least one for men only. In the interesting chapter on university extension, which has developed to such a remarkable degree in America, an account is given of the Chautauqua movement begun in 1874; tens of thousands make a kind of Canterbury pilgrimage to this lake-side summer resort, where a holiday may be combined with almost any form of study, and a degree obtained after three years, in each of which six weeks' work is done in Chautauqua classes, the intervening time affording opportunity for reading Chautauqua textbooks.

Though Professor Holme considers it impossible for Australia to copy the American university, which is totally un-British, and Australian universities must develop on the lines of British tradition as long as the Australian people remain a growth from the old stock—97 per cent. of which has the British Isles for its ancestral home—Australia may receive from America some precedents of obvious value, such as those of the "Dormitory," administration, federal aid, and graduate studies which are all critically examined.

THE BIRTHDAY HONOURS.

THE Birthday List contains some honours which will be received with more than ordinary satisfaction by the medical profession. In the first place it is to be noted that the honour of knighthood is conferred on two of the brightest illustrations of scientific medicine—Professor Arthur Keith and Dr. Thomas Lewis. Sir Arthur Keith has added lustre even to the post of Conservator of the Museum of the Royal College of Surgeons of England; he is equally at home in discussing the antiquity of man and in expounding the historical and comparative application of the abstruser truths of anatomy to every-day surgery, medicine, and anthropology. Sir Thomas Lewis is described in the list as honorary consulting physician since April, 1918, to the Ministry of Pensions; in that capacity and as Director of the Medical Research Council's Department of Clinical Research in the cardiographic department of University College Hospital Medical School he has formed one of the most interesting clinics in London, but before and since he has laid the profession in all countries under a deep debt of gratitude by reason of the originality and accuracy of his experimental observations on the mechanism of heart function, and the sanity and clarity of his application of these experimental researches to practical medicine. He is physician to University College Hospital and lecturer on cardiac pathology in its Medical School. His most important contribution to literature is the volume, the second edition of which appeared recently, on the *Mechanism and Graphic Registration of the Heart Beat*. Dr. Sydney Russell Wells, who also receives the honour of knighthood, has been Vice-Chancellor of the University of London since 1919; he, too, is known for his study of disorders of the heart. Dr. William Henry Willcox, who receives the distinction of K.C.I.E., is physician at St. Mary's Hospital, and was known before the war as medical adviser to the Home Office. As consulting physician to the forces in Mesopotamia he was a colleague of the late Sir Victor Horsley, and afterwards as medical adviser rendered important services to the civil administration in Mesopotamia. We have had the opportunity of publishing an account of many of his observations in these capacities, and in particular those on the cause and prevention of scurvy and beri-beri, and on the nature, prevention, and treatment of heat hyperpyrexia, while his interest in general clinical subjects is shown by the paper published only last week on infective arthritis in its relation especially to infection of the teeth. Major-General Sir William Rice Edwards, who also receives the K.C.I.E., entered the Indian Medical Service in 1886 and became Director-General in 1918. Much of his early service was spent on the North-West Frontier. He was on Lord Roberts's staff in India in 1890 and again in South Africa in 1900, where he much distinguished himself and received the C.M.G. In 1913 he was appointed Inspector-General of Civil Hospitals, Bengal, and in the following year became C.B. His work as an administrator has been marked by a statesman-like grasp of the medical situation in India and an appreciation of the need of improved medical and post-graduate education and of extended opportunities for research. While in Bengal he gave his aid in the foundation of the Calcutta School of Tropical Medicine; since he became Director-General he has shown a like interest in the establishment of the Bombay School of Tropical Medicine and has directed the energies of the Indian Medical Research Fund into some new and fruitful fields. He has been a loyal friend of his own service, whose cause he has championed without fear or favour in troublous times; the success which has attended the efforts of the British Medical Association to remove some of the disadvantages under which the Indian Medical Service has laboured has been due in no small measure to his sympathy. Surgeon Rear Admiral P. W. Bassett-Smith, C.B., who is promoted to be K.C.B., rendered important services both before and during the war while attached to the Royal Naval Hospital at Haslar and to the Royal Naval Medical College at Greenwich. The honour of knighthood is conferred upon Dr. F. Conway Dwyer, surgeon to the Richmond Hospital, Dublin, inspector of anatomy in Ireland, and formerly president of the Royal College of Surgeons in Ireland. A like honour is received by Brigadier-General Donald Johnstone McGavin, C.M.G., Director-General of the New Zealand Army Medical Service. The distinction of C.B. is conferred on Colonel Charles Edward Pollock, C.B.E., assistant director of the Medical Service, Eastern Command. The honour of C.I.E. is received by Lieut.-Colonel Benjamin Hobbs Deare, I.M.S., Principal of the Medical College, Calcutta, and Dr. Mohendra Nath Banerjee, principal of the Carmichael Medical College, Belgatchia, Bengal. The Kaisar-i-Hind medal is awarded to the Rev. Ernest Muir, M.D., missionary and research worker in leprosy, Bengal.

WOMEN AT CAMBRIDGE.

On June 4th, by a narrow majority of 116 to 111, the Cambridge Senate approved a grace authorizing a vote to be taken on June 16th upon both of the alternative propositions for regulating the relation of women students with the University. Votes for both graces will be accepted at the same time. In the event of the first being carried, the second will be withdrawn, and the votes destroyed. The present position arises directly out of the rejection last December of Report A of the Syndicate appointed to consider the question.[1] That rejection, together with the obvious impracticability of giving effect to Report B in

[1] BRITISH MEDICAL JOURNAL, August 21st, 1920, p. 284, and December 18th, 1920, p. 955.

face of the opposition of the governing bodies of the Women's Colleges, left the matter in a position admittedly unsatisfactory. The first proposal is the result of an informal conference of both parties, convened by the Vice-Chancellor, and the 187 signatures to the memorial, in which the scheme was submitted in April, include the names of fifty members of the Senate who voted *non placet*, and twenty-two who did not vote on December 8th. There is this evidence for a substantial measure of agreement upon the compromise which it embodies. The chief points in the scheme are (1) that women students would be matriculated members of the University, and security of admission to university teaching would be obtained; (2) that all degrees would be open to women; (3) that women would be eligible to be members of Boards of Studies, and for Professorships, Lectureships, Examinerships, etc., as well as for Prizes and Studentships; (4) that two women Assessors would sit on the Council of the Senate, with a consultative voice but no vote; (5) that the number of resident undergraduate women would be limited to 500, or such larger number as the University may from time to time prescribe by grace; and (6) that the discipline of the women students would be in the hands of a Board of Women, with two men Assessors. The scheme, as outlined above, definitely excludes women from membership of the Senate, and so falls short of granting the full membership for which the women had hoped. The compromise is, however, acceptable to the governing bodies of Girton and Newnham Colleges, who have signified their intention of refraining from the contemplated appeal to the Royal Commission if it is passed before that body concludes its inquiry. The second proposal is for the admission of women to purely titular degrees. This is a concession to which the women's colleges offer uncompromising opposition. They maintain that it would not materially ease the difficulties under which the staffs of the women's colleges at present labour, and that it would leave the difference in the status of women at Oxford and at Cambridge so clear that it is unlikely to do much towards stemming the alleged increasing tendency for the abler girls to turn to Oxford. It is announced this week that the Council of the Senate has now decided to postpone the vote on the relation of women with the University from June 16th to October 20th, on account of travelling difficulties.

RATS, SHIPS, AND CREWS' QUARTERS.

AT the annual meeting of the Association of Port Sanitary Authorities Dr. A. K. Chalmers, who is the medical officer to the Port Authority as well as to the City of Glasgow, introduced a discussion on what he called "de-ratisation of ships at British ports." His subject had nothing to do with the rates, and the word was, we believe, pronounced as though it were spelt with two t's; at any rate the subject debated was the destruction of rats, and, in particular, the need for some uniform method. It might be thought that the problem would be fairly simple in a self-contained place like a ship—we believe a ship to be a "place" for certain purposes—but there are difficulties, among them the obligation to use a fumigant which will not injure the cargo, and it is to be noted that it may be desirable to fumigate ships which are never completely unloaded at any one time at a British port. Another matter on which uniform practice was deemed desirable is the need for the regular destruction of rats after each voyage. Dr. Chalmers pointed out that though plague was primarily a disease of rats, there was no evidence that the rat plague in Eastern countries had diminished the number of rats; millions of rats had died of it in India, but there were as many there to-day as twenty years ago; not only were they numerically as strong, but from a bacteriological point of view their position was even stronger, since they might suffer from a chronic non-fatal but transmissible form of the disease. Again, at Copenhagen, when the authorities set out to trap and kill rats, the average catch was about 300,000; it was rapidly reduced by half, but remained at 150,000 for some time. It appeared that as fast as rats were killed the birth rate rose; it was only by the adoption of a special policy which consisted in killing the females and liberating the males, who fought and exterminated each other, that the catch was reduced to 90,000. The general opinion of the meeting seemed to be that though it was possible to diminish the number of rats on ships it was impossible to exterminate them in the ports. Eventually a subcommittee was appointed to confer with the appropriate Government department in the hope of devising some unified method for the mitigation of the evil. A discussion also took place on hygiene in crew spaces; it was introduced by Dr. J. Howard Jones, M.O.H. Newport Port Sanitary Authority, after communications from that authority, from the Hull and Goole authority, and from the River Tyne authority had been considered. Various speakers pointed out that the crews' quarters often needed improvement, and that some shipowners were willing to make improvements, but that the seamen themselves would need education in order to appreciate them. A committee was appointed to investigate the matter and make a report to the council.

PURE AND CLEAN MILK.

IN the JOURNAL of March 6th, 1920, p. 336, some account was given of the steps taken by certain public-spirited milk producers in this country to supply clean fresh milk free from the virus of tubercle or any other disease. For some time before March 14th, 1920, the Food Controller, acting in concert with the Ministry of Health and the Scottish Board of Health, had granted licences permitting the use of the designations "Grade A" and "Grade B" for milk of high hygenic quality. Since that date the system has been replaced by a modified plan not less exacting in its requirements. The Ministry of Health issues licences for two sorts of milk—"Grade A milk" and "Grade A (certified) milk"—and no person is allowed to use either designation save under licence by the Ministry. Our article described the conditions that must be fulfilled in the case of each kind. The licence for Grade A milk lays down strict requirements in regard to such matters as tuberculin tests for the cows, sampling of the milk, inspection of the farm, cooling of the milk on the farm, and its consignment in a sealed container labelled to show the address of the farm, the day of production, and whether from the morning or evening milking. In the case of Grade A (certified) milk further precautions are enforced. The milk, after cooling, must be bottled on the producer's premises in sterilized bottles, and labelled to show the day and time of production. Before delivery to the consumer it may not contain *B. coli* in one-tenth of a cubic centimetre (in each of two tubes) nor more than 30,000 bacteria per cubic centimetre, nor may it be delivered to the consumer as Grade A (certified) milk more than two days after the day of production. Further, it must be delivered to the purchaser in the bottles in which it has been received from the producer with caps intact. For both kinds of Grade A milk there are stringent conditions as to the employment of tuberculin for testing the health of the herd, and periodical veterinary examinations of the animals are required. Last week Dame Margaret Lloyd George opened the Grade A (Certified) Milk Dairy, recently established by the Express Dairy Company at College Farm, Finchley. The ceremony—under the chairmanship of Viscount Elveden, President of the Grade A Milk Producers' Association—was attended by a number of medical officers of health and other members of the medical profession. The visitors had an opportunity of seeing the special herd at milking time, and of observing the details of production, bottling, and laboratory control. It is of some interest to recall that a strong advocate of milk pasteurization, speaking of ideal reforms in an address delivered

thirteen years ago, laid down the following conditions which would have to be fulfilled in the technique of pure milk production: "In order to get milk with a bacterial content of less than 1,000 per cubic centimetre, such as von Behring regards as a not unattainable ideal, or even of less than 10,000, which is the standard for 'certified milk' at Rochester (N.Y.), you must be prepared to devote money and careful attention to the problem. The animals must be kept scrupulously clean. Complete asepsis must be aimed at in milking. The cows' tails, for instance, must be cleansed with an antiseptic wash. Before milking begins it ought to be possible to pass a white kid glove over the cow's udder without staining it. The milker's hands should be washed with special precautions before milking each cow, and special milking suits should be worn. A special cooling room must be available, and the milk should be filled into bottles and sealed for delivery as soon as possible. Always it must be kept cool. The bottles employed must be thoroughly cleaned and sterilized before the milk comes into them. To say nothing of the machinery required, it is obvious that all this needs conscientious workpeople." It would need but a few slight changes to turn this into a description of what actually happens to-day in the production of Grade A (certified) milk in England.

A BYWAY OF EVOLUTION.

DR. WALTER KIDD'S observations on the direction of the slope of hair on the bodies of mammals are well known to anatomists; they have extended over many years, and, did they do no more, would furnish ample evidence of his perseverance and capacity for taking pains. He has now gathered them together in a book,[1] and added many new examples. Shortly stated, his main purpose is to show how this line of evidence lends support to the Lamarckian, or rather, perhaps, the neo-Lamarckian, conception of evolution. Dr. Kidd considers that, apart from the centrifugal forces of the growing hair, the main causes of the formation of whorls, featherings, crests and other patterns of hair may be a certain centripetal force either in the form of friction, pressure, gravitation or muscular traction. These centripetal forces are the all-important factors. That muscular traction does have an influence on the direction of the individual hair is generally admitted—the erector pili muscle, for example. A more general expansion of a skin muscle, such as the platysma, can quite conceivably exert a more general effect on the hairs collectively over an area of skin. Another factor in this connexion does not appear to be mentioned—it is the shape of the individual hair on transverse section; this point is illustrated in the lie of the hair of a negro and a Malayan for example. The shape of the hair in all mammals is certainly not the same. The up-standing condition of the hair in *Choloepus*—certainly, as appears from the picture given, very striking—is attributed by the author to the effect of gravitation; but this effect is not nearly so well marked in *Bradypus*, an animal of similar habits. Moreover, the hair on the ventral surface of quadrupedal mammals, upon which gravity is constantly acting, is not erect as a general rule. Presumably Dr. Kidd would suggest that the intermittent pressure when the animal is lying down is sufficient to overcome the ever-present effect of gravity. It is, however, when one comes to examine the hair direction in horses and the author's explanation of the effects of harness that it becomes difficult to accept fully his conclusions. The evidence of the diversity of effect on the direction of the hair due to the pressure of a tightly or a loosely fitting collar, for example, is unconvincing and the critic is tempted to ask certain apparently trivial but nevertheless pertinent questions. How long, for instance, is it necessary for a horse to wear a particular collar before a specific effect is produced on the direction of the hairs? And further, if there is a change of collar from a tightly fitting to a loosely fitting, or vice versa—as, for example, on a change of ownership—does the direction of the hair, once established, become altered? Granting, however, for the sake of argument, that these hair patterns are due to the causes stated by Dr. Kidd, the really crucial point is, What evidence is there that these acquired characters are inherited? The only evidence that, so far as we have observed, Dr. Kidd records on this point has reference to ten foals stated (p. 136) to have had the same hair pattern as their mothers; in them the particular patterns are supposed to have been produced by the harness. Though the number is small, yet, if the proof of the inheritance of the acquired character were conclusive, it would be a really important point. But in another place (Chapter V) the author describes "fourteen out of a much larger number of the most instructive varieties of pattern" which he has collected. If the varieties of pattern are so numerous, it is not surprising that a foal should sometimes be born with the same pattern as its mother. What happens if the sire has acquired a different pattern from the mare? There are too many questions to which no reply is as yet forthcoming. Dr. Kidd speaks of the "unpopular doctrine of Lamarckism." Unpopular it is only in the sense that it is not accepted for lack of scientific proof. Many biologists would welcome it were the proof satisfactory. It would solve many difficulties; it would be of vast assistance in the solution of many a problem in sociology. Such evidence is not forthcoming as yet, and it is not to be found in the volume under consideration. As has been said, the book furnishes ample evidence of the author's perseverance and enthusiasm in the collection of material; it is a pity that he introduces so much that is irrelevant and indulges in a style that is often one of unnecessary levity.

[1] *Initiative in Evolution.* By Walter Kidd, M.D., F.R.S.E. 1921. London: H. F. and G. Witherby. (Med. 8vo, pp. 272; 80 figures. 15s. net.)

SPORT BY ARTIFICIAL LIGHT.

THE present hyperactivity of the sporting instinct is resulting in a demand for artificial illumination of games, even of games played entirely out of doors, partly that the zestful hours may be prolonged, and partly that the players may be rendered independent of the glare and vagaries of the sun. In the discussion at the Illuminating Engineering Society on May 31st, instances were given of how the artificial illumination of sports and games is being put into practice in America. In Chicago a baseball ground is illuminated at night by horizontally directed searchlights proceeding from lamps so placed around the arena that they do not, it is said, dazzle either the players or the spectators. In New Jersey, not only tennis courts in the open but even golf links have been lighted by incandescent gas. The holes on the links are painted white inside so as to be more easily visible. The artificial lighting of tennis courts is fairly well understood in this country, but night golf is something new, though there is a record of a golf match at Highgate which was finished by means of flares. It would seem feasible for golfers to practise putting by artificial light, and for cricketers to practise at the nets, although the illumination of an entire course or field might be out of the question. To judge from the discussion, however, it is the view of some promoters of sport that sunlight is considerably below artificial light in efficiency when the latter is properly distributed and controlled. In some future cricket test the wickets may fall by night instead of by day, which will bring another minor revolution into the habits of a large part of the community. In the case of indoor games the illuminating engineer is more sure of his ground. The illumination of the billiard table is already standardized. With the chess table it is different, and the loser might plausibly attribute his false moves to the dense shadows cast by the pieces when the light on the board

comes from an unduly oblique angle. There is some reason to believe that the watching of the swift passage of a ball, either at tennis or cricket, in indifferent or too brilliant daylight has caused injury to eyesight; eager interest in the game has made both spectators and players oblivious of conditions of eyestrain which they would resent and correct under other circumstances. Any study of illumination in this connexion, therefore, is likely to be useful, even if it does not serve the immediate object of turning the sportsman's night into day.

CLINICAL RESEARCH IN PHARMACOLOGY.

IN 1913 Professor Brauer, who occupies the Chair of Medicine in the University of Hamburg, put forward a proposal for the establishment of a research institute for clinical pharmacology. The main underlying idea was to bring about a greater measure of co-operation between the clinician and the pharmacologist. The observations of the pharmacologist on the action of drugs on animals and human beings, if unchecked by clinical observation, are of limited value, and in some instances may be misleading. Professor Brauer failed to obtain financial aid either from the State or from chemical manufacturers, the latter professing a fear that the scientific freedom of the staff might be diminished should manufacturers contribute to the support of the proposed scheme. Nevertheless Professor Brauer obtained enough from an anonymous donor to fit up rooms at the Eppendorfer Hospital. The details published in an article in the *Deutsche medizinische Wochenschrift*, on which we have to rely, are very incomplete. It would appear that the institute, so to call it, is recognized by the university and enjoys full scientific independence.

PRESENTATION TO DR. MACDONALD.

THE presentation to Dr. J. A. Macdonald will be made during the annual meeting of the British Medical Association at Newcastle. It is therefore necessary to close the fund, and any member who intends to subscribe and has not yet done so should send his cheque to the Medical Secretary, 429, Strand, W.C.2, at once. It was during the annual meeting at Cambridge last year that Dr. Macdonald ceased to be Chairman of the Council of the Association, after holding that office for ten difficult years. He was a member of the Representative Body from the beginning, and became its chairman in 1906, so that when he was elected Chairman of Council in 1910 he already had considerable experience of the business of the Association. He never grudged time or energy in its service, and it is very fitting that the occasion should be taken to give him some tangible expression of the gratitude of its members.

WE regret to announce the death, on June 2nd, at the age of 51, of Dr. J. M. Fortescue-Brickdale, Physician to the Bristol Royal Infirmary.

Medical Notes in Parliament.

[FROM OUR PARLIAMENTARY CORRESPONDENT.]

Public Health Officers Bill.

THE private bill introduced by Sir Philip Magnus was considered on Report, on June 3rd, as amended in Standing Committee. The first clause set forth that the medical officer of health of a local authority, who by the terms of his appointment was restricted from private practice as a medical practitioner, should not be appointed for a limited period only, but should be removable by the authority with the consent of the Minister of Health, or by the Minister, but not otherwise. Sir Philip Magnus, under a promise made in Committee, moved to insert the words "in cases to which this section applies." This amendment having been agreed to, he moved as an addition to the clause the words:

This section applies to:
(*a*) the medical officer of health of a county borough where any portion of the salary of the medical officer was paid out of moneys voted by Parliament before it was constituted a county borough;
(*b*) the medical officer of health of a county district any portion of whose salary is paid out of the county fund of the county in which the district is situate and charged to the Exchequer contribution account.

On a division the amendment was carried by 100 votes to 17.

The second clause made similar provision as to tenure of office and appointment of sanitary inspectors, but with the provision that where more than one sanitary inspector was appointed by a local authority the clause should only apply to the senior sanitary inspector. Under the bill inspectors of nuisances are to be deemed and called sanitary inspectors.

Mr. John objected to the distinction between a senior and junior sanitary inspector, and moved that the section should apply to all sanitary inspectors. Sir Philip Magnus agreed with most of the arguments used by Mr. John, but said that it was absolutely essential, if the bill was to go through, that the promoters should make concessions to those authorities which some years before bought their freedom by refusing to accept any grants from the Government. That was why the application of this bill was limited both as regards medical officers of health and sanitary inspectors. It was better to have four-fifths of a loaf than no bread. Mr. John, in the circumstances, withdrew his objection, and the bill was read a third time.

The Dentists Bill.

The Dentists Bill, introduced by the Minister of Health to give effect to the recommendations of the Departmental Committee on the Dentists Act, 1878, was taken in Grand Committee of the House of Commons on June 7th, under the chairmanship of Mr. Turton. The provisions were summarized in the BRITISH MEDICAL JOURNAL of May 14th, p. 715.

The principal discussion in Grand Committee was as to the future position of dentists at present unregistered as provided for in the bill. Under Clause 1 of the measure, which is to take effect not earlier than one year nor later than three years from the commencement of the Act, the practice of dentistry by unregistered dentists is to be prohibited. But existing unregistered dentists are to be given the right of admission to the register, subject to evidence of good character, if they satisfy the Dental Board (to be set up) that they have for five years out of seven immediately preceding the commencement of the Act been engaged in the practice of dentistry as their main means of livelihood, or for one year before the commencement of the Act have been members of the Incorporated Dental Society. Existing unregistered dentists who have been in practice less than five years will be required to pass an examination before admission to the register. The Board is to have dispensing power to deal with cases of persons who cannot meet the requirements of the bill by reason of military service.

Dr. Fremantle, on behalf of the British Dental Association, moved an amendment to the Admission Clause (III) to the effect that the unregistered dentists who were to be admitted as registered dentists should be placed on a separate list. His argument was that there should be some discrimination between those who had been fully trained and qualified and those who were to be registered but had not previously so qualified. This was opposed by Colonel Wedgwood and Mr. Seddon.

Sir Alfred Mond (Minister of Health) said he did not like the idea of anything suggesting a separation of sheep and goats. If the amendment were passed it would have the effect of not registering dentists whom it was intended to benefit. For that reason he could not accept it. The amendment would, indeed, if approved, wreck the measure, as it would cut to the foundations of the scheme. Earlier in the session he had refused to introduce the bill because he had understood that it was controversial, but, subject to there being a general agreement amongst those concerned, he had announced he was willing to go forward with it. Otherwise he could not do so, as the Government time was so limited.

Dr. Fremantle said he had no desire to imperil the bill, neither had the British Dental Association. He withdrew his amendment.

Mr. Seddon afterwards moved that members of the National Dental Association and the Chemists' Dental Society should be given the same right of admission to registration as were to be conceded to the Incorporated Dental Society—namely, that membership for one year before the commencement of the Act should qualify for registration. He urged that the National Dental Association had been very effective. Its members were not floating from village to village or town to town, but had permanent residence in their districts.

Mr. Acland, who was chairman of the Departmental Committee, opposed the inclusion of the National Dental Association in the provision. He did so becaus the witness who attended the departmental inquiry on their behalf had omitted to sign his evidence for publication. Mr. Hartshorn, for the Chemists' Dental Society, said they were prepared to accept the bill as it stood, and did not desire special inclusion.

The amendment was negatived by 26 votes to 6.

The bill, after some further discussion, was passed to be reported to the House.

It should be added that the powers of the General Medical Council, so far as they relate to the maintenance of the *Dentists Register*, will be transferred to the Dental Board, but any regulations made by that Board under the bill must be approved by the General Medical Council and the Privy Council. The Board of 13 is, in the first instance, to be wholly nominated. Afterwards six of its number shall be elected by dentists as prescribed in the schedule. Three of its appointed members will be chosen by the General Medical Council, three by the Minister of Health, and one (the chairman) by the Privy Council.

Dogs' Protection Bill.

Sir F. Banbury, a few minutes before the time for the automatic close of the sitting on June 3rd, moved the second reading of the Dogs' Protection Bill. He said that as a similar bill had already passed a second reading on three different occasions, twice without a division and once with a considerable majority, lengthy explanation was not required. Sir Watson Cheyne summarized the chief objections which the medical profession and scientists had against the bill. He and all his friends were dog lovers; it was not that they disliked dogs, but that they could not afford to lose the experience that could be gained from them. They asserted that there were many fields of knowledge that must be explored if they were to advance the science of medicine, and some of the observations that they gathered from the dog were quite necessary. The animals that were usually used in experiments fell into four classes: the small rodents—rats, mice, and guinea-pigs; dogs, and cats to a smaller extent; horses; rabbits, and apes. Other animals were only occasionally used. Rodents were almost entirely used for investigations into infectious diseases. Horses were used not so much for experiments as for commercial purposes—for the producing of serum such as tetanus antitoxin which saved so many lives in the late war. The dog and the ape were really the only two animals from which was derived the main part of our knowledge of the processes of health and disease. It was true that most of the work could be done with apes, not so conveniently in some cases, certainly not so cheaply. But one or the other must be used for various reasons. To obtain results that could be applied to the treatment of disease animals must be used whose mode of life resembled man's. Apparently it did not matter to Sir Frederick Banbury what animals were vivisected so long as they were not dogs. There were various objections to the use of apes. First, they were scarce in this country; secondly, they were not so easily handled. If a dressing were put on a dog he did not trouble so much about it; in a few hours he apparently forgot it. But the ape did not forget; he never rested satisfied until he had torn open the stitches and vitiated the whole experiment. There was the further consideration of the expense; men engaged in this sort of work were, in the great majority of cases, poor. The results got from the experiments on dogs were of the greatest value. They were the groundwork of all knowledge of the healthy processes of human nature. Physiology, the science of health, was based almost entirely on observations on dogs. Sir Watson Cheyne was still speaking when the House stood adjourned, the debate to be renewed the following Friday if the order be reached.

Glasgow Pensions Committee and the Bellahouston Inquiry.—Mr. Neil McLean, on June 2nd, put a number of questions to the Minister of Pensions as to the Glasgow War Pensions Committee which recently resigned. The Regional Director deputed an officer to take charge of the work in the area, and invited organizations of ex-service men in Glasgow to nominate members to form an advisory committee. This Committee, which meets weekly under the chairmanship of the Regional Director, is composed of ex-service men nominated by the British Legion, the Limbless Ex-Service Men's Association, the Trainees Protective and Welfare Union and the Independent Grand Order of Ex-Service Men, together with a few members of the late Divisional Committee which acted under the local committees for the subdistricts of Glasgow. On these proceedings Mr. McLean raised two separate points. He asked, in the first instance, whether notices of dismissal had been served on certain officials of the clerical staff of the department in Glasgow, and he suggested that these notices should be suspended in view of the public inquiry into administration at Bellahouston Hospital. Mr. Macpherson, in his answer, stated that it had been found necessary for efficiency and economy to reorganize business in the local office, and certain officials, whose services were not required, were given notice; all the files needed for the inquiry would be available. Mr. McLean's second point was as to certain reports which appeared in the Glasgow papers from the ex-service men's Advisory Committee, describing conditions in Bellahouston Hospital as satisfactory, such statements being liable to prejudice the inquiry. Mr. Macpherson replied that Bellahouston Hospital had not been under the direct management of the Local Committee, but of the Joint Disablement Committee for the South-West of Scotland. He was informed, however, that the Advisory Committee obtained permission from the Regional Director to send two deputations to visit that hospital. On receipt of their reports the Advisory Committee placed on record their satisfaction at the general arrangements of the hospital without desiring to anticipate the inquiry. He was not aware that the action of the Advisory Committee was regarded as an attempt to prejudice the inquiry; nor, in view of the fact that the great majority of men under treatment at Bellahouston were natives of Glasgow, and obtained their treatment at the hospital through the local War Pensions Committee, did it seem at all unreasonable that the Advisory Committee should decide to ascertain for themselves that the existing conditions of treatment were satisfactory. Mr. Barnes asked whether the dismissal of some of the clerical staff of the local War Pensions Department in Glasgow had any connexion with the alleged irregularities in Bellahouston Hospital. Mr. Macpherson stated that they had not. The Glasgow Local War Pensions Committee had nothing to do with Bellahouston Hospital; that hospital was under the Glasgow and West of Scotland Joint Disablement Committee.

Colonial Medical Services.—Dr. Fremantle asked, on June 1st, when the Colonial Secretary proposed to publish the evidence given before the Departmental Committee appointed by his predecessor to inquire into the Colonial Medical Services; and whether he would give a return showing the number of medical appointments vacant in the various colonies under the Crown and stating the steps being taken to fill them. Mr. E. Wood, Under Secretary for the Colonies, replied that it was not possible to publish the evidence, as some of the witnesses were assured that it would not be published, and without that assurance that evidence would not have been given as freely as was desirable. He would consider whether the return suggested could usefully be given. Dr. Fremantle asked whether the Colonial Secretary intended to appoint a Director-General of the Colonial Medical Service, who would, *inter alia*, advise the Minister and permanent staff of the Colonial Office as to all questions relating to the personnel of the Colonial Medical Service. Mr. Wood said that as the recommendations of the committee were at present being considered in connexion with the observations of the Colonial Governments he could not make any statement as to the decision to appoint a Director-General of the Colonial Medical Service. Dr. Fremantle asked whether the Colonial Secretary had sanctioned a minimum salary of £600 per annum, with pension, for colonial medical officers, as recommended in the report of the Colonial Services Medical Committee. Mr. Wood replied in the negative. He said the differences in the resources of the several colonies were so great and the conditions under which their medical officers served so diverse, that he saw no prospect of its being possible to insist that Colonial Governments should adopt the minimum named as a hard-and-fast rule. In a number of the most prosperous colonies the local Governments had adopted and in some cases exceeded the minimum. Dr. Fremantle asked if it was conceivable that any decent respectable medical man could be obtained to go abroad for a less salary than that amount. The Speaker observed that that did not arise out of the question.

National Insurance Administration.—Sir A. Mond stated, on June 1st, on the inquiry by Mr. Wilkie and Sir T. Bramsdon, that he hoped at an early date to introduce a bill to give effect to the recommendations of the Departmental Committee on National Insurance Administration. The Ministry of Health has informed Mr. Hodge as regards the increase in the cost of administration for the insurance section of the Ministry as between 1914 and 1920—that is, prior to July, 1919—the central administration was in the hands of the Insurance Commissioners, and has since formed part of the work of the Ministry of Health, it was impossible to give the precise cost of the administration in 1920. No useful comparison could be made between the cost in 1914 and 1920, as throughout the latter year the department was engaged in the very laborious operation of the preparation of the fresh valuation of approved societies.

Insurance Practitioner's Refusal to Disclose.—Sir A. Holbrook asked, on June 2nd, whether the Insurance Committee of the area comprising Bramley, near Basingstoke, had received intimation that a portion of the Exchequer grant payable to it would be withheld in consequence of a local practitioner having declined to give information detrimental to one of his patients, acquired by him in the course of his duties, such information having been called for at the behest of a rich corporation with whom the man was insured; and whether the Minister of Health would take action to secure that a doctor should not be penalized for doing his duty to his patient. Sir A. Mond replied that in the case to which the question appeared to refer an approved society sought to obtain the opinion of the medical referee of the Ministry on the question of the incapacity for work of one of their members who was claiming sickness benefit. The insurance practitioner had definitely declined to give any particulars as to the history and condition of the patient likely to assist the medical referee, notwithstanding the provision in his terms of service, which clearly required him to do this. In these circumstances it had become necessary to inform the doctor that a portion of the Exchequer grant, forming part of his remuneration, must be withheld, the grant being payable only if the terms of service were complied with. But in accordance with the provisions of the regulations, any representations which the doctor wished to make in the matter would first be considered.

Ministry of Health: Reorganization.—Sir A. Mond, in answer to Sir S. Hoare, on June 2nd, said that the reorganization scheme of the Ministry of Health was not yet in operation. Throughout the public service, supervising assistant clerks had been assimilated into the higher clerical class, intermediate clerks into the executive class, and first class women clerks into the clerical class. The question of the transfer of any of the first class women clerks to the executive class or the higher clerical class would be considered when the number of such posts arising out of the pending reorganization was known.

Pension Patients in Mental Hospitals.—Mr. John Davison asked the Minister of Pensions, on May 31st, whether in any of the mental hospitals under his control methods of treatment advised by medical officers had been withheld from patients, and, if so, on what grounds; whether schemes of employment suitable for patients were in operation in these hospitals, and, if not, whether such schemes would be instituted. Mr. Macpherson replied that he had no knowledge of any instances in which treatment advised by responsible medical officers had been withheld from patients in hospitals under the control of his department for the treatment of neurasthenia and other mental disorders which were not certifiable under the Lunacy Acts. In the majority of these institutions suitable occupational treatment had already been provided, and it was hoped that it might be found possible to extend the arrangement for the remainder.

VOLUNTARY HOSPITALS COMMITTEE.

THE Voluntary Hospitals Committee, over which Viscount Cave presided, was appointed on January 25th "to consider the present financial position of the voluntary hospitals and to make recommendations as to any action which should be taken to assist them." The members of the Committee were Lord Linlithgow, Sir Clarendon Hyde, Sir W. B. Peat, Mr. Vernon Hartshorn, M.P., and Mr. R. C. Norman. The Committee has now completed its report, of which we are enabled to give the following preliminary account.

The report points out that the present financial difficulties of the hospitals are due to the war. The receipts from voluntary subscriptions, donations, and legacies have not fallen off—they have, on the contrary, risen by 67 per cent. since 1913—but during the war the cost of provisions, drugs, dressings, fuel, and labour increased to such an extent that the expenditure of the hospitals has increased by 138 per cent. since 1913. The aggregate deficits of all the voluntary hospitals of Great Britain for the present year are estimated at £1,000,000.

The Committee recognizes that the voluntary system is temporarily in jeopardy, and asks, "Is the voluntary system worth saving?" The answer is, "We are convinced that it is." Apart from the immense sum of voluntary subscriptions and donations (estimated at £3,000,000 a year), the voluntary system secures gratuitous and skilled service, both lay and medical, of inestimable value. It preserves freedom in medicine, and is of inestimable value to the welfare of the sick, the training of the medical profession, and the progress of medical research. The breakdown of the voluntary system would imperil these services and impose a constantly growing charge upon public funds.

It will be remembered that the Committee issued an interim report in March,[1] in the course of which it stated that the evidence already received had convinced it that it was desirable, in the public interest, to maintain the voluntary system of hospital management, and also that, mainly owing to the large increase during and since the war of salaries and wages, and the cost of provisions and materials, the hospitals were faced with a serious deficiency of income to meet the necessary expenditure. The interim report recommended as a pressing matter that the schemes to be approved for the distribution of the surplus disclosed at the quinquennial valuation of approved societies under the National Insurance Acts, should provide for the application of a substantial part of the surplus in making a contribution towards the cost of the maintenance of members of the societies in hospitals. This was recommended in the interests both of the hospitals and of the societies.

The Committee now expresses the opinion that if the voluntary hospitals are to be saved immediate assistance must be given by the State, such assistance to be strictly limited to a definite period of two years, and to be given only to hospitals which show that they are taking all possible steps to re-establish their financial position. A grant so limited and conditioned would re-establish the hospitals in the self-supporting position which they occupied before the war, and would not be inconsistent with the maintenance of the voluntary system.

The Committee draws attention to a number of steps which managers of voluntary hospitals can themselves take to improve the financial position of the hospitals under their charge—for example, review of expenditure, particularly in the light of comparative costs which could be ascertained by the general adoption of a uniform system of accounts; co-operative buying of drugs, apparatus, stores, and some kinds of provisions; removal of convalescent cases to auxiliary hospitals; co-ordination of appeals for subscriptions; further development of new sources of income, such as subscriptions from wage earners and employers, and other contributory schemes, examples of which are quoted in the report; contributions from approved societies.

The following recommendations, if adopted, will require legislation or executive action:

1. That a Hospital Commission should be set up by the Minister of Health.
2. That Voluntary Hospitals Committees be formed in each county and county borough; the King Edward's Hospital Fund for London to perform the functions of a Voluntary Hospitals Committee for the Metropolitan Police District.
3. That Poor Law guardians be authorized to enter into arrangements as to the use of infirmaries.
4. That county councils be empowered to contribute to the expenses of Voluntary Hospitals Committees.
5. That failing the provision in the National Health Insurance Acts of a "hospital benefit," the Courts be authorized to award to hospitals compensation under the Employers' Liability and Workmen's Compensation Acts.
6. That local authorities be authorized to pay the cost of the treatment in hospitals of persons in their employ.
7. That the payment out of technical education funds of grants for the training of nurses be considered.
8. That provision be made for obtaining and tabulating returns of cases treated in hospitals.
9. That all contributions by employers to hospital funds be allowed as deductions from profits for income tax purposes.
10. That where the payment to a hospital of a testamentary gift of residue is delayed for more than a year, the hospital be authorized to claim repayment of income tax.
11. That legacy and succession duty on testamentary gifts to hospitals be remitted.
12. That Parliament be asked to sanction a temporary grant of £1,000,000 to be expended under the direction of the Hospitals Commission in the assistance of hospitals which require it.
13. That the Hospitals Commission be authorized during a period of two years to recommend grants for the extension and improvement of hospitals, subject to like contributions being made from private sources.

The intention would appear to be that the Hospital Commission should consist of the ablest workers in various leading organizations, philanthropic and medical, that have been identified with hospital services. It is proposed that the Hospital Committee to be set up for each county council, county borough or other area as may be desirable, for arranging as to organization, shall consist of not less than nine persons; in London advantage will be taken of the existence of King Edward's Fund to entrust the work to the Committee of that body.

The intention of the proposal to empower county councils to contribute towards the expenses of Voluntary Hospitals Committees is that county councils should become one of a number of new sources of support for hospitals.

The recommendation in paragraph 3 above, that the Poor Law guardians should be authorized to enter into arrangements as to the use of infirmaries, has reference to the utilization of vacant beds, but does not, we understand, imply any general taking over of the Poor Law infirmaries. The section of the report in which these matters are discussed is voluminous, and will require careful consideration.

[1] BRITISH MEDICAL JOURNAL, March 26th, 1921, p. 463.

England and Wales.

THE LEEDS DEPARTMENT OF PATHOLOGY.

IMPORTANT developments in the department of pathology of the University of Leeds have been steadily going on for a good many years, and some of the more important of them are of recent date. There was a time, and that not very long ago, when there was no definite connexion between the university and the infirmary in respect of pathological work. The autopsies were made by the assistant physicians, who of course afforded all facilities to the professor of pathology. Not only so, but Dr. Jacob and Dr. Trevelyan, who in succession held the position of professor of pathology, were themselves assistant physicians to the infirmary during a part of the time of their tenure of office. When Dr. Leyton was appointed professor, a rule was passed by the infirmary, on the recommendation of the faculty, which practically secured for the holder of the post a place within the walls of the infirmary, and as it was and is rather quaintly expressed in the rules of the infirmary, "Every candidate for the office of pathologist shall hold the position of professor of pathology and bacteriology in the University of Leeds." The members of the assistant staff continued to make autopsies, two days a week being allotted to the professor. It was regarded as a very valuable part of the duty of an assistant physician that some work of this kind should fall to his lot, and it was deemed desirable that a good many of the autopsies should be made by those who were fully in touch with clinical work. The clinical and pathological laboratory at the infirmary was under the charge of Dr. Matthew J. Stewart. During Dr. Leyton's tenure of office as professor of pathology at the university important changes were made, and under special arrangements a large amount of work was done for the Corporation of Leeds and for various centres in the rest of Yorkshire. When Dr. Leyton's regretted illness led to his resignation of the chair, Dr. Stewart was appointed by the council of the university as his successor. In harmony with the rule quoted above he was soon elected pathologist to the infirmary, and it was further arranged that, though the work in the *post-mortem* room was still to be done by several different members of the staff, Dr. Stewart should, as official pathologist to the infirmary, be responsible for the general supervision of the work in the clinical and pathological laboratories of the infirmary.

An arrangement has been entered into by the university, the infirmary and the Corporation of Leeds for the amalgamation of their various pathological interests. Professor Stewart is the responsible working head of this conjoint department, and there is an advisory committee representative of the three bodies, to which he submits an annual report. This report is before us. The staff includes, in addition to Professor Stewart, who is also "city bacteriologist," the lecturer in bacteriology, J. W. McLeod, O.B.E., M.B., Ch.B.; the lecturer in pathology, W. MacAdam, M.A., B.Sc., M.D., Ch.B., M.R.C.P., D.P.H.; the demonstrator in pathology, J. Gordon, M.B., Ch.B.; the demonstrator in bacteriology and public health, G. A. Wyon, B.Sc.Lond., M.D., Ch.B.Edin.; the demonstrators in pathology and bacteriology, H. H. Gleave, M.B., Ch.B.Leeds, and H. V. Phelon, M.B., Ch.B.Leeds; and P. L. Sutherland, M.B., D.Sc., who is the lecturer on industrial diseases. There are also two honorary demonstrators in pathology—namely, Dr. Gruner and Mrs. Clara Stewart. The two honorary demonstrators in medical and surgical pathology are acting members of the assistant staff of the infirmary, and this arrangement is regarded as being very important and as securing that there shall be on the pathological staff men who are in daily touch with clinical work. They hold regular museum classes.

The report to which we have referred gives an admirable summary of the work carried out in the joint department. For the infirmary, 520 autopsies have been performed; 4,199 specimens (not including those from the venereal diseases department) have been examined; of these 2,321 were pathological and 1,878 were bacteriological. Dr. MacAdam is responsible, under Professor Stewart, for the work in the laboratories at the infirmary, where he is assisted by Dr. Gleave, and members of the honorary staff are pleased to have the valuable assistance of one who is a trained chemical pathologist and a keen investigator. All the bacteriological work of the infirmary is carried out at the extension of the department of pathology, which is situated in St. George's House, adjoining the medical school, where Mr. McLeod, Mr. Wyon and Mr. Gordon act under the professor. The bacteriological work for the Public Health Department of the City of Leeds has been carried out in terms of the agreement with the Corporation, and 3,848 specimens have been examined. The work under the venereal diseases regulations has been carried out during the year for the boroughs of Leeds, Hull and Middlesbrough, and, for part of the year, for the City of York; altogether 11,406 specimens have been reported on. Some work has been done for the Ministry of Pensions. A further bond of union between the infirmary and the university is expressed in the conferring by the Board of the Infirmary of the titles of assistant bacteriologist and assistant pathologist on those who hold the lectureships on these subjects. It is pointed out that the pathological and bacteriological work is thus carried on in three places—namely, in the medical school of the university, in its extension in St. George's House and at the infirmary. It would be by no means a wise thing to work towards the complete concentration of the laboratory work either at the infirmary or at the university, but it would indeed be a great advance if, apart from the making of autopsies and those examinations which subserve a clinical purpose, all the work could be concentrated in one central institute, and this is what is in the minds of many who are far-seeing and hopeful.

LEEDS WORKPEOPLE'S HOSPITAL FUND.

The thirty-fourth annual report of the Leeds Workpeople's Hospital Fund presents many gratifying features. The total income from all sources during the year 1920 was £39,739, which is an increase of nearly £14,000 over the year 1919. The main source of income, and the most reliable, is the weekly collections from the various workshops in the city; they amounted to £28,505, which was £9,511 more than in 1919; this proves that the appeal to the workpeople to increase their weekly subscriptions has been largely responded to. Collections in public houses, school collections, competitions and other efforts, including the annual gala, make up the rest of the income. Carried over from 1919 was the sum of £1,996. From this total of about £41,000 grants were made to the various charitable institutions of the city. The General Infirmary received the handsome grant of £20,000, an increase of £10,000 over last year; the Leeds Public Dispensary received £3,000; the Hospital for Women £2,500; the Leeds Maternity Hospital £1,000; the District Nursing Association £800, and smaller institutions various sums from £200 to £50. The Fund also concerns itself with the support of convalescent homes; one of these is for men, and to it 785 patients were admitted during last year; two others for women are situated at Ilkley, and to these 539 patients were admitted. The benefits of these homes are confined to the subscribers to the Fund, and there is no doubt that the popularity of the Fund as a whole has been greatly enhanced by their institution, though, when it was begun, it appeared to some that the character of the organization was being somewhat altered from that which prevailed in the first instance, when the only object aimed at was the provision of money for the charitable institutions of the city.

BRISTOL UNIVERSITY.

As briefly announced in last week's JOURNAL, the University of Bristol has received with deep regret the announcement of the impending resignation of Sir Isambard Owen, M.D., the Vice-Chancellor. It will take effect at the end of the current year, owing to the new rules of the Treasury with regard to superannuation. Sir Isambard Owen, before he went to Bristol, had associations with the West, for he was born near Chepstow in Monmouthshire, and spent much of his boyhood at Gloucester. At the time when he was physician and lecturer in medicine at St. George's Hospital, he took a prominent part in the steps which led to the establishment of the University of Wales. In 1904 he gave up active practice to become Principal of Armstrong College, Newcastle-upon-Tyne. His experience in the reconstitution of the University of Durham proved of great value to him after his appointment in 1909 as Vice-Chancellor of Bristol

University. His powers of organization had full play at Bristol. During his twelve years' work in the internal administration of the university he has found time to promote in many ways the interests of the university and enlist for it public support in the wide area which it serves in the western counties.

INTERNATIONAL TUBERCULOSIS CONFERENCE IN LONDON.

An international conference on tuberculosis will be held in London at the Institution of Civil Engineers, Westminster, from July 26th to July 28th. The National Association for the Prevention of Tuberculosis, which represents Great Britain and Ireland on the Council of the International Union against Tuberculosis, has decided to merge its annual conference in the international meeting and will act as host. The International Union is the successor of the International Tuberculosis Conference which, down to 1913, assembled annually in one or other of the capitals of Europe or in America, and its purpose is to achieve an effective combination of the nations of the world against tuberculosis. The conference is open to members of the International Union against Tuberculosis and to official delegates from countries within the League of Nations and from the United States of America, and also to representatives from all authorities interested in the subject, to whom a fee of one guinea (to include a copy of the Transactions) is charged. The President of the International Union for the current year is M. Léon Bourgeois, President of the French Senate, who will be succeeded on the occasion of the conference in London by Professor Sir Robert Philip, of Edinburgh. The conference is to be welcomed to London on behalf of the Government by Lord Curzon of Kedleston and Sir Alfred Mond, Minister of Health. Addresses will be given at the opening meeting of the conference by M. Léon Bourgeois and Colonel George Bushnell, of the United States Army Medical Corps. The subjects for discussion include "The modes of diffusion of tuberculosis throughout the races of the world," to be opened by Professor Calmette, of the Pasteur Institute, Paris, and "The rôle of the medical profession in the prevention of tuberculosis," to be opened by Sir Humphry Rolleston, followed by Sir George Newman, Chief Medical Officer, Ministry of Health. The Lord Mayor of London will give a reception in honour of the International Union at the Mansion House on July 26th, and other social functions and visits to institutions of special interest are being arranged.

Scotland.

BELLAHOUSTON HOSPITAL.

IT was mentioned last week that the Minister of Pensions had appointed a committee to inquire into the management of Bellahouston Hospital by the Ministry of Pensions and the Joint Disablement Committee for the South-West of Scotland. Questions upon the subject which have been put and answered in Parliament have been reported from time to time, but it will be interesting to summarize the position; for the following information we are indebted to the files of the *Glasgow Herald*.

The question at issue, it would appear, is one of the administration and indirectly of the efficiency of the out-door department of Bellahouston Hospital, an institution maintained by the Ministry of Pensions. Its staff is paid by the Ministry; the indoor surgical and medical staff is drawn from physicians and surgeons, both senior and junior, who are on the staffs of the three large Glasgow voluntary hospitals, and these physicians and surgeons are men in the first rank in Glasgow. While the hospital is an institution belonging to the Ministry of Pensions it is nominally managed by the Joint (Disablement) Committee for the South-West of Scotland, composed of membere elected by the Local War Pensons Committees, certain other organizations, and discharged men. This managing body has among its members many of the best known men in civil life in Glasgow, men who have occupied the highest position in municipal affairs: Sir Thomas Dunlop, G.B.E., Sir A. M'Innes Shaw, C.B., Sir John Samuel, K.B.E., and Sir Charles J. Cleland, chairman of the Education Committee, who is chairman also of the above Committee.

The chairman of the committee alleged in the press that the Ministry of Pensions for some considerable time had been limiting the power of the committee until now it was wellnigh shorn of every vestige of authority. The dismissals, numbering as many as 900 outdoor patients, mentioned by Mr. Neil McLean, M.P., in his question addressed to the Ministry of Pensions on April 14th, came as a surprise to the committee, and were ordered without its knowledge or consent. The chairman stated in the press that the state of affairs which led to the dismissal of these pensioners was entirely due to the repeated refusals of the Ministry to act upon strong representations from the committee for an adequate medical and surgical staff in the out-patient department.

The Ministry replied on April 21st, pointing out that as long ago as September last instructions had been sent to Bellahouston that the entire medical staff of the hospital could be made available for out-patient as well as for in-patient treatment; the fact that these instructions were not carried out, necessitated the intervention of the Commissioner of Medical Services in December. The medical superintendent of the hospital, in consultation with the Commissioner of Medical Services, provided a remedy for the defective working of the out-patient department by making available the services of other members of the medical staff of the hospital for the examination and treatment of out-patients; the Minister went on to say that if the Joint Disablement Committee were ignorant of the alleged dismissals of the out-patients, then there was serious ground for anxiety as to the effectiveness of the supervision of the hospital exercised by the committee.

Sir Charles Cleland, on behalf of the committee, replied to the Ministry on April 26th. The reply is much too long to quote, and we can note one point only. Sir Charles Cleland asks: "Why, when the superintendent of the hospital proceeded to clear out the out-patient department, he did not obtain the services of some of the visiting staff instead of the services of the junior resident staff? . . . The position as regards the discharges from the out-patient department is that the newly appointed medical superintendent, with the aid of members of the junior staff, examined about 2,000 patients between February 5th and February 12th, and discharged about 953 as fit for work. Many of these cases were sent back to hospital on stretchers and in ambulances within 48 hours." This letter, dated April 26th, contains the names of 12 members of the committee who have intimated their resignation, and our information is that since the date of that letter, on April 28th, the Corporation of Glasgow appointed a committee to approach the Government to set up a public inquiry into the situation at Bellahouston Hospital, with the result mentioned last week that a committee of inquiry, with Lord Scott Dickson, Lord Justice-Clerk of Scotland, as chairman, has been appointed. It held its first meeting on June 6th. Since the resignation of members of the voluntary committee, Colonel Warden, Regional Director, Ministry of Pensions, has adopted means whereby the interests of the patients at Bellahouston will be looked after.

Ireland.

ROYAL VICTORIA HOSPITAL, BELFAST.

AT the meeting of the board of management of the Royal Victoria Hospital, Belfast, on June 1st, the notification of the resignation, under the age limit rule, of Professor James A. Lindsay, M.D., F.R.C.P., senior physician, was received with great regret, and he was appointed to the consulting staff. Dr. J. E. MacIlwaine, senior out-patient physician, was elected to fill the vacancy, and an election for assistant physician will be held on June 15th. On the recommendation of the medical staff, Professor Lindsay will probably be asked to deliver clinical lectures at the hospital during the teaching session.

DR. F. B. POWER was recently presented at a meeting in Washington with a gold medal, to commemorate his services as director of the Wellcome Chemical Research Laboratories, London. The presentation was made by Mr. Henry S. Wellcome.

Correspondence.

CAPILLARY PRESSURE.

SIR,—I have read Dr. Leonard Hill's lecture on capillary pressure and oedema, published in your issue of May 28th, 1921, and am amazed that a man of his eminence could be guilty of so much fallacious reasoning through failing to take account of some elementary facts in physics.

In paragraph 2 he states his belief that the pressure of the brain against the skull is a measure of the pressure in the arterioles and capillaries within the brain; and in paragraph 3, that the pressure of the cerebro-spinal fluid is the same as the above, and practically the same as the pressure in the cerebral veins. He might as well give the height of the barometer in a garden as a measure of the pressure in a hose-pipe at work in the garden.

When two portions of fluid are separated by a membrane on the stretch the pressures of the fluids at two opposed points are not equal unless the membrane have plane surfaces at the place. If the membrane be concave on one side and convex on the other—as, for example, in a soap bubble—the pressure on the concave side is greater than that on the convex side. With a given tension in the membrane, the smaller the radius of curvature of the curved surface the greater the difference of pressure on the two sides. When the curved surface has the form of a tube the inside pressure exceeds the outside pressure by $\frac{T}{R}$, where

T = the tension per unit of length tending to split the tube longitudinally, and
R = the radius of the tube.

This may be expressed by the equation

$$p_1 - p_2 = \frac{T}{R},$$

p_1 and p_2 representing inside and outside pressures respectively.

Now the walls of capillaries are incapable of sustaining much tension; but, their radius being very small, about 0.000005 cm., a small tension can maintain a considerable difference of pressure between inside and outside. Thus, using c.g.s. units—

Let $p_1 - p_2$ = the pressure caused by 50 mm. of Hg.
= 5 × 13.6 grams per sq. cm.
= 68 grams per sq. cm.

Then $68 = \frac{T}{0.000005}$,

and T = 0.00034 grams per cm. of length.
= 0.34 milligrams per cm. of length.

The maintenance of a considerable pressure in the capillaries, above that of the surrounding tissues, by a small tension in their walls, does not appear to have occurred to Dr. Hill. The walls of capillaries being so thin and collapsible, they are kept open only by having a higher pressure inside than outside. As they have no muscle cells in their wall, their diameter depends largely on this difference of pressure distending them more or less as the case may be.

Dr. Hill has also failed to take fully into account that the blood is not a simple fluid, but consists largely of corpuscles not much less in diameter than the capillaries. When he makes a slight increase in the outside pressure in his modification of the Roy and Brown apparatus described in paragraph 17, this causes a diminution of the tension in the capillary walls, resulting in a diminution of calibre, which causes a slowing of the current, although he may not have made the outside pressure anything like as great as the inside pressure, as he wrongly assumes he has done in paragraph 19. Even when he has increased the pressure so as to stop the flow of corpuscles through a capillary, he has probably not made the outside pressure equal to the inside pressure, but only reduced the calibre of the capillary to that of a corpuscle which then blocks it.

There are several other points in the lecture which I should like to criticize, particularly the explanations of certain phenomena in the eye given in paragraphs 5 and 6, but I fear you will think my letter already too long.—I am, etc.,

JOHN R. GILLESPIE, M.A., M.D.

Knock, Belfast, May 31st.

THE PREPARATION OF SCIENTIFIC PAPERS.

SIR,—I have received to-day the JOURNAL of May 21st. Without waiting till my return home next week, I wish to thank mildly Dr. C. O. Hawthorne for his instructive criticism. To one who used to read his writings until driven off by his verbosity, it is very satisfactory to learn that he now intends to get rid of all superfluities.

"Should have found it necessary." Here the *it* is not redundant, but is essential to represent the thing which was necessary. There is a difference between having an independent opinion and having got one for an express purpose, though he does not seem to think so. Let him substitute idea, or any other appropriate word, and perhaps he will appreciate the difference. I have got a variety of paper fasteners, some very ordinary and others rather uncommon, but none with me on my journeyings, otherwise I might have sent him a sample.

I am obliged to him for looking up the double verification of the tower in Siloam. I am sorry he had not a much-needed dip in the pool. You may have a painting "in oils," or "in water colours," but an artist works with his brushes and a variety of paints. I must thank him for drawing attention to the split infinitive, an error into which I do not often tumble. To express strongly, which he suggests, implies the use of strong language, which is foreign to my nature, and certainly outside the vocabulary of a child. Another critic, who does not appear in print, suggests that I should have said, wished strongly. This would have been an egregious mistake, as I have no standard to measure the strength of my own wishes, and I would not attempt to gauge those of another. It would seem, therefore, that for accuracy of expression there is nothing left but either to break the rule of the grammarian or to omit, strongly. The little personal embellishments presented by this person, supercilious in appearance and in character, I can afford to ignore, especially as I am not living in a London fog. I have not followed his example, and so I have eschewed all repetition of his name, having found the personal pronoun quite sufficient.

I am very pleased to have this opportunity of pointing out an error in my letter which seems to have escaped the notice of others. I used the genitive singular, speciei, where I intended to use the nominative plural. I was using so many genitives that I suppose this one crept in inadvertently.—I am, etc.,

Dinard St. Enogat, June 3rd. JAMES BARR.

THE PREVENTION OF PUERPERAL INFECTION.

SIR,—The discussion on this subject is of exceptional interest to the general practitioner, and ought to be of immense profit to him as well. The opinion of the general practitioner, who does the large proportion of the midwifery practice of the country, is surely of some value, but probably the most successful do not bother to express their opinions. I have attended a good number of cases—being at present well in the second thousand—under all sorts of conditions and with the assistance of all sorts of nurses. I have had trouble with sepsis, including one case of death from pyaemia, which I would not wish to occur to my worst enemy; it takes more out of a conscientious man than six months' ordinary work.

In my earlier cases I was all in favour of "leaving things to Nature," which counsel was given me by several shrewd practitioners of many years' standing. My later cases have been absolutely differently conducted, the principle being "get the labour finished as soon as possible." The latter I find the more successful by far, for it has most certainly not increased the morbidity, while at the same time it has won the gratitude and approval of the patients and their friends and saved me valuable time.

The one case of death from pyaemia was a 6-para. I never made a vaginal examination. I arrived in the room as the head was passing over the perineum; the placenta came away perfectly, and there was only a slight perineal laceration which I then considered not serious enough to require a stitch. From this case and others in which there has been a slight rise of temperature I am satisfied that perineal lacerations are the biggest factor in the production of sepsis; they get infected from the vulva, napkins, etc., and it is easy to see the danger of such infected wounds when there is the raw placental surface

at no great distance, and the interval is often bridged with blood clot. Iodoform and boracic powder should be freely used, and a vaginal douche given night and morning. My advice is: Watch the perineum, and even if you arrive when the confinement is completed, do not believe the nurse, but see for yourself that the perineum is all right, and your morbidity will decrease by 50 per cent.

The second point I wish to emphasize is this: the third stage should not be rushed. One should wait at least half an hour if there is no haemorrhage, and if gentle pressure will not expel the placenta it is much safer to wash carefully and remove it manually than to use excessive force, with the risk of leaving a piece behind or tearing off the membranes. These manipulations rarely cause trouble; for, first, special care is taken to wash both one's hands and the patient; and secondly, no one should think of leaving such a case without giving an intrauterine douche of several quarts of lysol solution, and leaving instructions for a vaginal douche to be given night and morning for several days at least.

Thirdly, in multiparae, when the first stage is passed, the pelvis normal, and the presentation straightforward, pituitrin ½ to 1 c.cm. with chloroform is to be preferred to forceps. The results are most gratifying to all concerned, and no amount of academic reasoning will convince to the contrary the man who has used it with the necessary caution in any considerable number of cases. Pituitrin expels not only the baby and the placenta, but also blood clot; and when ergot is given after the third stage, an empty and well contracted uterus is the result.

On the other hand, if pituitrin is contraindicated—and it must not be used indiscriminately—why be afraid to use forceps? The second stage can often be terminated in a few minutes, and it is unnecessary to do more than to insert two fingers for about one inch into the vagina to apply the forceps successfully. It is criminal to use unsterilized forceps, and surely every man is taught how to wash up both himself and the patient and pass a catheter.

In a primipara one may sit for two hours or more watching the head bobbing into and out of the vagina, the perineum stretching a little more with each pain till, at the end of the long wait, the last pain gets the head through far enough to begin a tear of the perineum, which is so thinned out that it rips down to the rectum rapidly and the baby is born. It seems to me that this bobbing in and out of the head is as dangerous as the insertion of two aseptic fingers and along these the sterilized forceps, which need never touch hair or skin. And, I believe, with skill, the perineum will be saved as often with forceps as with natural termination.

The great point is not to leave things to Nature—which is quite out of date—but get the second stage over as painlessly as possible, provided that if forceps are used they are followed by thorough douching, preferably intrauterine.

The cases in which the hand has been inserted are certainly not those most likely to go wrong. This is my experience and the experience of others with whom I have talked; the reason is that thorough douching has followed and aseptic precautions have been taken. The simple cases, where there has been no interference, go wrong far more frequently—the simple perineal laceration is overlooked, becomes septic, and leads to sapraemia, and possibly septicaemia. But the douching must on no account be left to the nurse. I witnessed one "skilled" female push the basin of antiseptic up to the patient and proceed to syringe the lotion into the vagina, allowing it to return from the vagina into the basin! And still we are puzzled as to the cause of sepsis? The great trouble is, in fact, that many patients cannot afford to pay proper nurses. The vaseline on the patient's vulva indicates that the nurse has made at least one, if not a dozen, vaginal examinations before the doctor's arrival with his antiseptic. Further, I personally never like to attend a case with a midwife who is herself attending a number of other cases, for one is apt to leave too much to her, and, on the other hand, she is not so careful when a doctor is there to share responsibility and blame. This is why these cases do not do so well as when the midwife herself attends alone.

To sum up the points I wish to emphasize:

1. Get the second stage over as painlessly as possible. If the patient is not having morphine and hyoscine, pituitrin may be used in suitable cases or forceps, provided always that the doctor himself follows the forceps immediately with thorough douching.

2. Do not rush the third stage; empty the uterus manually without hesitation, but follow this with a thorough intrauterine douche.

3. It is most important to take great care with all perineal lacerations; such lacerations precede a very large number of septic cases. The vagina should be douched before and after repair, and iodoform and boracic powder should be freely used.

Success in preventing puerperal sepsis does not await any new discovery, but depends on attention to well-known details, and I have been well repaid by attention to the above points.—I am, etc.,

Ilford, E., May 23rd. N. BEATTIE, M.D.

SIR,—During the years 1913 to 1920, while in charge of a maternity hospital in India, I had considerable opportunities for studying the above subject. It is in the hope that my experience may be of some value to others that I venture to address you.

When taking over charge of this institution I found that sepsis was by far the commonest cause of death in the obstetric practice of the hospital, and this was not surprising, as the majority of cases had already been examined by untrained midwives of the barber caste before admission.

In combating this state of affairs, the introduction of gloves, a strict aseptic ritual, and the restriction of vaginal examination to complicated cases by a competent obstetrical medical officer, played their part. But there remained a certain number of infected cases which, in spite of an empty uterus, intrauterine douching, etc., ended fatally. In several such cases I removed the uterus, but only one of these recovered, and I came to the conclusion that by the time I could make up my mind that such a severe measure was necessary either the local infection had spread too far or the patient's infection had become too severe for there to be a reasonable chance of recovery. It is only necessary to examine a uterus so removed to be convinced of the futility of curetting an infected uterus.

At this time I had started using the Carrel-Dakin method in my general surgical wards for the treatment of infected wounds, and was very pleased with the results obtained. I decided to give the method a trial in cases of puerperal sepsis.

Method.

After trying various techniques, it was found that the solution could be best applied to the infected uterus by means of a rubber tube, the two ends of a suitably sized tube being attached to two arms of a Y-shaped glass tube, the distal three inches or so of the loop thus formed being perforated with numerous holes and placed in the uterus. The Y tube being of course outside the vagina, had its stem connected up by means of a rubber tube, with an irrigator containing Dakin's solution. The flow of the solution was controlled by a clip on the last tube. By releasing the clip about one ounce of solution was allowed to douche the interior of the uterus every hour night and day.

This treatment gave apparently excellent results, and during the last complete year it was used there was only one death from sepsis out of the thirteen deaths from all causes that occurred in the 433 cases of labour that were attended. This result was a very great improvement on all previous years' results, and, considering the large number of infected cases admitted, was very gratifying. The details of the treatment were ably carried out by my house-surgeon, Rai Sahib Shiva Rao M. Trasi, M.B., C.M.

With reference to Dr. Blair Bell's remarks on autoinfection, the only cases I have seen in which I would dare to entertain such a suggestion were two cases of infection in obstetrically normal, clean, unexamined cases suffering from influenza. These occurred during the great influenza epidemic. This disease I soon recognized to have a most grave bearing on the prognosis when occurring in those subject to premature or full-term labour.—I am, etc.,

C. BRODRIBB,
Major I.M.S., late M.O. in charge King Edward's Hospital, Secunderabad, Deccan.

Penmaenmawr, May 20th.

SIR,—Writing on the "prevention of puerperal infection" in your issue of May 28th I notice one of your contributors denounces the use of gloves in midwifery. He gives the following three reasons:

1. "They diminish tactile sensibility." Now if the gloves are a good fit they cannot possibly hinder the perception of such gross anatomical landmarks and relations as the os, bag of membranes, fontanelles, cephalic sutures, prolapsed cord, or the proper engagement or otherwise of any foetal part in the pelvic brim.

2. "The hands are clumsily washed . . . the result is that the left hand still infected presses on the fingers of the right glove and they are fouled." Surely no one would ever dream of touching the fingers of a sterilized glove with a bare hand, however clean. If the glove after being boiled, say in a little bag for the purpose, is emptied into a basin containing a weak solution of lysol—the basin having been previously scrubbed with a boiled nailbrush and scalded out from a kettle—nothing is easier than catching hold of the wrist of the glove with the clean left hand and slipping the right hand in up to the fingers as far as it will go, keeping hand and glove under the surface of the solution. It will be still easier if a washed piece of soap is added to the lysol.

3. "It is considered unnecessary to dip the gloves in an antiseptic." Your correspondent goes on to state that as a consequence any infectious material about the vulva is carried into the vagina without any inhibitant. But how could the momentary contact of an infective organism with perchloride or biniodide of mercury inhibit its growth? And why should the use of gloves prevent anyone from previously cleansing the vulval area? No doubt many cases of sepsis occur where no vaginal examination has been made. But why should this fact make us do away with the use of gloves?

I agree with your correspondent that sterile aprons are dangerous. In a house where there is no help they will not long remain sterile, and are therefore liable to give a false sense of security.

Some time ago a writer in the BRITISH MEDICAL JOURNAL advocated palpation per rectum. I thought I would try this, and was astonished to find how much information can be obtained from this method. As no aseptic ritual is required, it can be done before the patient is washed up. One can always carry a few rubber finger stalls for this purpose to every confinement or threatened abortion. Another of your correspondents fears that an examination per rectum of a patient in labour, as a substitute for the classical "per vaginam," could only result in the instant dismissal of the accoucheur. Fortunately this has not yet been my experience.—I am, etc.,

Leeds, May 28th. H. T. O'NEILL.

SIR,—From the statements made in your leading article and Dr. Blair Bell's paper published in the BRITISH MEDICAL JOURNAL of May 14th it would appear that the objects of the Midwives Act have not been attained. I have always deplored the folly of medical men in giving away their obstetric practice to the so-called qualified midwife. They ought to conduct as many of these cases as they possibly can and to take a pride in getting the best results possible. The more they attend the greater will be their experience and efficiency, and the greater will be their ability to distinguish between the varying degrees of the normal up to the abnormal pregnancy and confinement. Why the general practitioner should wish to avoid midwifery has always been a mystery to me. I am quite sure it will pay him to give his best attention to these cases, and if he will do so at the confinement, as well as during the puerperium, he will find that the present mortality will be greatly reduced.

Without observing all the minute details of the ritual advocated by some of your correspondents, my mortality from puerperal sepsis has been 0.6 per 1,000 of the 1,500 cases I have conducted—that is, one death, and this happened where the surroundings were much better than the average. I believe the latest mortality rate is 1.76 per 1,000, almost three times the number in my own practice. I have been quite as successful with lysol as with biniodide. One point I observe is not to dry my right hand after thoroughly washing and scrubbing it, and always to rinse it in antiseptic after and before each vaginal examination. Should I need to use my left hand I rewash and scrub it first. I think it quite possible that infection may be conveyed by wiping one's hands on a clean (?) towel.

The present increasing attendance by midwives at confinements does not seem to decrease the mortality from puerperal sepsis; this object might be attained by every general practitioner making a speciality of obstetrics and not allowing any one but himself to make vaginal examinations where these are necessary. I think it quite likely that, where a certified midwife and a doctor both attend a case, the midwife may have contaminated the patient before the doctor has touched her.

There is something very mysterious about puerperal infection, especially considering the experience given in the letter by "Old Fashioned" in the JOURNAL of May 28th. It is a fact that most of my cases which have required the most manipulation have shown no signs of infection, while other more normal cases have not got on so well.—I am, etc.,

Bournemouth, May 30th. J. M. LOVETT.

SIR,—Like other general practitioners, I have been more amused than wrought by Dr. Blair Bell's address and by your leading article thereupon. Our withers remain unwrung. For myself, it is satisfying to find the views on this subject which I expressed in the BRITISH MEDICAL JOURNAL of December 18th, 1920, so strongly confirmed by the letters in the JOURNAL these last two weeks. In my article I stated that "cases of sepsis will occur . . . in which one will not be able to trace a cause . . . the pursuit of a technique which experience has shown to be adequate is enough." I know, from Dr. Bourne's letter in the following issue, that such a view moves Harley Street, and moves also, apparently, Rodney Street to wrath; but, after all, it is the general practitioner who bears the brunt of midwifery practice, and whose opinion is most likely to be generally accepted. What would old Dr. Hutchinson of Liverpool have said to Dr. Blair Bell's "absolute necessities" after *fifty-two* years in general practice without a maternal death?—I am, etc.,

Harston, Cambridge, May 31st. W. J. YOUNG.

SIR,—The prevention of puerperal fever is so vitally important that I may be praised for joining in the present discussion.

It is evident that until the public is further enlightened no practitioner may avoid internal examinations without losing practice. What is chiefly important in internal examinations is the size of the pelvis and the help in diagnosing presentations. Anyway there is no need to put the finger up into the uterine cavity or high in the cervix. The presenting part is felt through the anterior fornix. If no fingers were passed inside the cervix, and if no *post-partum* douches were given except under hospital conditions, puerperal sepsis would diminish by half.—I am, etc.,

Wolverhampton, May 31st. FREDERICK EDGE.

REFRACTION WORK IN SCHOOL CHILDREN.

SIR,—As a refractionist of considerable experience I would like to add a word to the discussion on the relative merits of objective and subjective refraction work. During the last ten years I must have done 30,000 refractions, and I am prepared to maintain that if the objective work be done by the right methods and with sufficient care, in most cases (except myopia) any subjective test, except to find what visual acuity is obtained with the correct glass, is waste of time.

The following method, in most cases, will give the cylinder, with an error less than 0.25 D., frequently less than 0.12 D., and the axis as accurately as the frames will allow it to be read.

Taking a case of compound hypermetropic astigmatism, and using the plane mirror, I first correct the meridian of least hypermetropia with a sphere. Then I put in the frame with this sphere a + cylinder somewhat less than the total amount of the astigmatism. If the astigmatism were 4 D, I would use a + 3 D. cyl. I turn this until the bright band indicative of astigmatism running across the pupil lies directly in the axis of the cylinder. This can be done with great accuracy, and an error of 5 deg. will send the band round through 10 deg. or 15 deg. in the opposite direction. Holding smaller cylinders in

my hand I then neutralize the remaining amount of the astigmatism, and often in doing this I find that I have to alter the lens that at first seemed to correct the meridian of least error.

With the correct glass in front of the eye there should be no trace of astigmatism. Adding − 0.5 sph. the shadow should move with, equally in both meridians, and adding + 0.5 sph. it should be reversed, or with the concave mirror it should still move with. Subtract the reciprocal of the distance at which you work and you have the correction.

In a difficult case I work the whole thing out again using a concave mirror, first correcting with a sphere the meridian of greatest hypermetropia and then the astigmatism with − cylinders. The latter method should give the same prescription as the former, only transposed. If the refracting surfaces of the eye are regular the cylinder is obtained by this method with much greater accuracy than by any subjective method in the average school child. If there be much irregular astigmatism the results are uncertain, but those of subjective testing are equally uncertain in such cases.

I do not profess to get the sphere with the same accuracy, as one frequently finds that different spheres are required to correct the centre and the edge of the pupil. In a highish hypermetrope an error of a fraction of a dioptre in the sphere, provided the error be not over-corrected, is unimportant, but in a myope I like to see what sphere gives the best vision. I consider I can do without difficulty 10 cases in an hour, and more if they are easy ones.

Imperfect mydriasis makes objective testing difficult, but it makes subjective nearly valueless. I have found hyoscine a useful cycloplegic. It should be used in a ¼ per cent. solution in castor oil. The alkaloid, not the salt, should be employed, and a good hour should be allowed for its action. In some 10,000 cases I have seen no toxic effects, but have made one child delirious by using a 1 per cent. solution.

Messrs. C. W. Dixey have made me a retinoscopy mirror in which a plane and a suitable concave mirror can be used conveniently with no waste of time.—I am, etc.,

T. W. LETCHWORTH,
Assistant Surgeon, Royal Eye Hospital; Ophthalmic Surgeon, Tottenham and Surrey Education Committees.

London, W.1, May 28th.

SIR,—It might be of some value to others to add the experience of one who has worried to some mastery of the subject, though through many personal and admitted mistakes.

There can be little doubt about the best method of prescribing glasses for school children. It falls into three stages:

1. At the first interview the visual acuity of each eye and then both eyes is recorded, and a note made of any external defect. (In a public administrative scheme, especially in country districts, this step can form part of the original routine examination of the child and need not necessarily be made by the oculist.) Arrangements are then made for the application of a mydriatic.
2. At the second interview the eyes are fully under atropine, and the error of refraction is estimated by retinoscopy and any disease of media or fundus noted. The child is told to cease the application of the mydriatic.
3. At the third interview—about two weeks later—a subjective test, based on the retinoscopy finding, is attempted in children over 7 years of age.

Now it is true that in some cases this attempt at subjective testing proves time-wasting, or would prove so if persisted in. It is also admitted that sometimes the retinoscopy findings are given preference in contradiction to the child's statement, as when a vigorous hypermetrope will not accept any plus glass at all. But it is also true that in many cases subjective attempt not only checks one's own possibilities of error, but vastly improves the child's chance of a *comfortable* correction, especially in astigmatic cases, where it can often say whether the cylinder in the trial frame makes the letters "slant sideways" or not.

Again, the individual child's power of accommodation varies and should occasionally be allowed for. A healthy outdoor type of country lad does not always appreciate being relieved of all his ciliary effort. And here I join issue with the dogmatist. Not the objective test alone, nor the subjective, should be the final answer, nor need a full correction be always given, but the considered guidance of all factors should determine the final prescription. To rely on retinoscopy alone, however experienced—and I venture to add, however expert one may become—is in my opinion helping still further to augment the income of the thriving prescribing optician.

But such a two-staged routine takes time and patience, and, from a public administrative point of view, means money. I suspect that in some ophthalmic school schemes no administrative provision is made for the possibility even of a subjective test *after* the effects of the mydriatic have passed away.

This point—the opportunity and the attempt at a subjective test in children—should be an acknowledged necessity, and I agree with the opinions advanced by Dr. A. E. Larking in your issue of May 21st, p. 759.—I am, etc.,

C. ALSTON HUGHES, M.D., D.Ch.O.

Liverpool, May 29th.

SIR,—We read with great interest the letter of our old friend Dr. Blease (p. 792), and note that he considers both subjective and objective methods should be employed; that only about three cases an hour should be done, and that the doctor should do the frame fitting himself. We have such confidence in Dr. Blease's skill that one of us has always entrusted his own eyesight to his care, but we doubt whether his practical judgement is in this case worthy of his professional skill. Staffordshire has about the lowest rateable value per child of any county in England; funds are therefore strictly limited; we have approximately 10,000 children requiring refraction, including about 2,000 squints. We fail to see "how the goods can be delivered" on such idealistic lines. In this district the local education authority would discover that the best was the enemy of the good, and that common sense in matters medical was rare, and usually in inverse ratio to the degree of education.

We regret to note from Dr. Larking's letter that any education authority or medical officer of health feels competent to dictate the exact rate at which a responsible official should work. In Staffordshire we only endeavour to impress upon our staff that the problem is how to do most good to a hundred thousand children with one oculist and no immediate prospect of more. In these days of financial crisis we weaken our influence with the public by ignoring the economic side of medical questions. Moreover, it would be interesting to hear the earliest age at which the correspondents use and place value on the subjective tests. We have found it only occasionally of value in children of 12 years, but even in children of 13 years in cases of astigmatism most reliance has to be placed on retinoscopy, and our experience in refraction work is that in most cases a difference of 10 degrees, and sometimes even of 20 degrees, in the axis of a cylinder would not be elicited on testing. How often has one found that even emmetropic children with normal fundi will not read all they see!

If much time is spent over the examination the child becomes tired, and no reliable information is then obtainable; so that to examine only three children in one hour does not necessarily mean that the best results accrue, nor that work more quickly done means work inaccurately done.

By far the greatest number of cases referred to the school oculist are children under 12 years of age, so that he must usually rely solely on the retinoscopy. Hence we agree with Mr. Bishop Harman that subjective tests in school children are of little practical value, and that such refraction work should only be carried out by those who have had the necessary experience to judge what is best to help the child to derive most benefit from education.

Dr. Blease points out—and we agree with him—that no reliance can be placed on complete cycloplegia being obtained from the parents' use of atropine, and hence in Stafford county we arrange for the school nurse to insert the atropine at the clinic or the school.—We are, etc.,

A. G. WILKINS (Senior Medical Inspector) and
JAS. WILLIAMSON (County Oculist) for the County of Stafford.

May 30th.

THE ORGANIZATION OF SCHOOL OPHTHALMIC WORK.

SIR,—Mr. Bishop Harman's lucid article (BRITISH MEDICAL JOURNAL, May 28th, 1921) on the organization of school ophthalmic work is both interesting and instructive. There is one aspect of school ophthalmic work the importance of which requires to be emphasized—namely, the connexion between school clinics and an eye hospital.

Mr. Harman points out that this is essential in order that difficult cases may be properly dealt with. I should like to remark that this is also necessary from the point of view of the oculist himself. The number and variety of ophthalmoscopic conditions to be seen in a school clinic are very small, retinoscopy occupying a very large proportion of the work. So also the number of external diseases is small, if one excludes chronic blepharitis and phlyctenular conjunctivitis. Again, there are no facilities in the school clinics for operating or seeing operations performed. In order, therefore, that the school oculist may be proficient in the practice of ophthalmology as a whole, he must have a wider field of activity than the school clinic. The school oculist, it seems to me, ought to be allowed to spend two afternoons a week in the clinic of an eye hospital. The most satisfactory arrangement seems to hold where the school oculist devotes his forenoons (two and a half hours for five days a week) to the school clinic, and spends his afternoons at an eye hospital and at private practice.—I am, etc.,

JAMES N. TENNENT,
Ophthalmic Surgeon, Dumbartonshire Education Authority.

Glasgow, May 30th.

CELL ACTIVITY AND SPECIFIC DRUG ACTION.

SIR,—As a general practitioner I was much interested in Dr. S. E. White's letter on cell activity and specific drug action which appeared in your issue of May 7th. The search for the specific curative drug in any case of disease, acute or chronic, must ever remain the chief aim of applied therapeutics. The suggestion that the selection of a drug by means of a close comparison of all its known and recorded symptoms and effects, with the total symptomatology presented by the diseased patient, is the basis of homœopathy. The homœopathic physician believes that in so administering a drug he is administering a specific stimulus to curative tissue reaction. The letter might well have been written by a homœopath; and I cannot see any material difference between the suggestions put forward by Dr. White and the principles by which homœopaths have selected and do select their drugs.

To my mind a more important consideration is whether such a method of drug selection is possible, practicable, or worth while. It is possible because homœopathy possesses a large and complete "symptom register" pertaining to many drugs. The symptoms so recorded have been elicited by the administration of each drug to large numbers of healthy people who were willing to be subjects of experiment, the drug being "pushed" in many instances till serious and poisonous effects were produced. The symptoms felt and the signs presented by each "prover" were carefully correlated and compared with those presented by other "provers," and symptoms doubtfully due to the drug were eliminated. Clinical use and experience, moreover, have still further established a true symptomatology, while the effects of criminal and accidental poisonings have extended our knowledge of drug effects beyond those possible in a "proving." The net result is that, for the main drugs at least, the "symptom register" is full and genuine.

It is practicable to use this method by carefully taking note of *all* the symptoms presented by the patient—that is, his total divergence from his own or the commonly accepted normal; and not only those particulars which would lead to a diagnosis of the disease he is suffering from. It is then necessary to compare this record with the already existing symptom registers referred to; and to choose therefrom the drug which most closely corresponds to it. The drug is then administered in a dose which must be sufficient to stimulate reaction but insufficient to add to the sufferings of the patient, who—if the choice of drug be correct—is hypersensitive to it. That it is the tissue reaction which cures, and not the drug directly, is suggested by the fact that a repetition of the dose before the first has exhausted itself is very likely to stop reaction altogether. This method of choosing a drug is obviously laborious and time-consuming to the novice, and frequently enough to the experienced homœopath. The results, however, make it well worth while. At the worst they are as good as the physician could formerly get by using drugs in the ordinary manner; in most cases they are decidedly better, and in some they appear at first as little short of miraculous. Cases that have resisted ordinary drug treatment can often be satisfactorily dealt with; and even those that one had considered hopeless remain hopeless no longer. All this only if the physician spare neither time nor trouble. There are no short cuts to success, and homœopathy offers no royal road to the cure of the sick. What it does offer is the means to cure so long as the patient has tissues that are capable of curative reaction.—I am, etc.,

London, N., May 19th. W. N. BARKER, M.B., Ch.B.

HEART-BLOCK.

SIR,—I do not think that a paper such as that of Dr. Wardrop Griffith (May 28th, p. 763) should be allowed to pass without criticism, and especially that part where he says "it is clear that the systolic plateau is dimpled by the drag of the contracting auricle." Is it the function of the auricle to "dimple," and if not, why in this particular case? Did Dr. Griffith take the cardiogram from the patient sitting up or lying down? Was the receiver one inch or three inches in diameter? A reference to my article in the February number of the *Practitioner*, on "The pericardial factor in heart disease," will show that a great deal depends on the position of the patient and the size of the receiver, and that what may be a "dimple" in one position may be something quite different in another.

Apparently no consideration has been given in Dr. Griffith's cases to the quantity and quality of the pericardial fluid present; that they should be taken into account is proved by the fact that when the quantity is in excess, as in pericardial effusion, both waves and "dimples" disappear, whereas in toxic conditions the quality of the pericardial fluid varies with that of the other fluids of the body, and shows itself by an increased number of waves, due probably to a modification of the negative intracardial pressure.

His first case is stated to have died "without any obvious (*sic*) cardiac symptoms": possibly something abdominal was the cause of death; yet, are not the pericardial conditions very often disturbed in abdominal and especially peritonitic affections? The cardiac tracing in Fig. 5 is, in my opinion, one that suggests a toxic condition, and the fact that the heart conditions improved towards the end tends to confirm it.—I am, etc.,

Swansea, May 30th. G. ARBOUR STEPHENS.

THE "MEDICAL DIRECTORY, 1922."

SIR,—We beg leave to inform you that the annual circular has been posted to every member of the profession. We shall be grateful for its early return to us. If any practitioner fails to receive the form we will, upon request, send him a duplicate.—We are, etc.,

THE EDITORS OF THE "MEDICAL DIRECTORY."
7, Great Marlborough Street, London, W.1,
June 4th.

Obituary.

SAMUEL THOMAS KNAGGS, M.D., F.R.C.S.I.,
Sydney.

WE regret to record the death, on April 13th, of Dr. Samuel Thomas Knaggs, who, until his retirement seven years ago, was one of the leading medical men of New South Wales. He was born in Ireland in 1842, and was brought by his father to Newcastle, Australia, six years later, and there he went to school. He returned to Dublin to study medicine, and in 1870 he obtained the diplomas of L.R.C.P.I. and L.R.C.S.I., passing his Fellowship examination and also graduating in medicine and surgery at Aberdeen University in the following year. In 1873, after he had returned to Australia, he obtained the degree of M.D.Aberd. He became one of the best-known general practitioners in New South Wales, was honorary surgeon to the Newcastle Hospital, joined the New South Wales naval forces, attaining the rank of fleet surgeon, and received the Victorian Decoration. In 1875 he became editor of the *New South Wales Medical Gazette*, which, however, ceased publication six months later. Attracted by medical journalism, Dr. Knaggs two years afterwards started his own medical journal, *The Australian Practitioner*, which was admirably edited and had a considerable effect on the public

health activities of that time in the colony; but the business side was unsuccessful and publication eventually ceased. After twelve years' practice in Newcastle Dr. Knaggs went to Sydney, where he again began in general practice. His reputation had preceded him, however, and he soon became honorary surgeon at the Royal Prince Alfred Hospital, lecturer in clinical surgery at the University of Sydney, and examiner in anatomy and physiology to the Board of Technical Education. Later he accepted the position of medical officer of the Education Department, and afterwards was a member of the Board of Health of New South Wales; he was also appointed honorary surgeon to St. Vincent's Hospital, Sydney. His interests in the affairs of the New South Wales Branch of the British Medical Association dated from the very beginning of the Branch, and in 1886 he was chosen to fill the position of President. In 1895 the Branch acquired by purchase *The Australian Medical Gazette*, which had been established fourteen years before, and the first issue under the new management appeared in January, 1895, with Dr. Knaggs and Dr. L. R. Huxtable as editors. Dr. Huxtable died in July of the same year, and Dr. Knaggs continued as responsible editor until 1901. The six volumes of the *Gazette* during his period as editor stand as unassailable evidence of his ability as a medical journalist. After he relinquished the editorship of the *Gazette* he made a voyage to the East, and practised for some time in Kobe, Japan; on his return to Sydney he practically retired from private practice, and for the last seven years had lived in absolute retirement.

Dr. W. H. Crago writes in *The Medical Journal of Australia*: After an acquaintanceship with the late Dr. S. T. Knaggs, extending over forty-five years, I would like to add my tribute to his memory. Dr. Knaggs was a man of the most genial disposition, large-hearted and generous to a fault. As a friend he was loyal and incapable of doing anything mean. Nothing was too much trouble to him when he could do a kindly act to assist a friend or one in need of help. His advice and practical assistance were readily given to the younger men in the profession. It may truly be said of him that he upheld the best traditions of the profession in doing to others what he would that they should do to him.

ALEXANDER ROSE MACLEAY, M.B., C.M.EDIN.,

Honorary Physician, Bootle Borough Hospital.

DR. ALEXANDER R. MACLEAY died suddenly, from heart failure following operation, on May 29th. Born in Inverness, he graduated at the University of Edinburgh in 1887, and after holding residential appointments at the Infirmary, Inverness, and at the Eye Infirmary, Newcastle-on-Tyne, he settled down in practice in Bootle some thirty years ago. Dr. Macleay had a large practice in Bootle and surrounding district, and was one of the foremost practitioners in the town. Painstaking and keeping himself thoroughly abreast of the times in scientific medicine, Dr. Macleay was appointed one of the honorary physicians to the Bootle Borough Hospital. His keen interest in his profession precluded him from taking any active part in public life. Yet his interests in everything that pertained to the well-being of the community were very close, and his support, quietly and unostentatiously bestowed, was known to many of his fellow townsmen. His outlook on life and its varied problems was that of a philosopher as well as a medical man. His sudden death came as a shock to many of his friends who were unaware of his illness; of a quiet disposition and somewhat reserved, he disliked to draw attention to himself. Indeed, it may be said that Dr. Macleay went about his daily work doing good, realizing that such a life brought its own reward. It was this characteristic that brought him such genuine affection from rich and poor alike.

The funeral took place at Sefton on June 1st; a large number of mourners, including many medical men, were present to pay a last tribute of affection to the memory of one who had so truly earned the esteem of all with whom he came into contact. He leaves a widow, for whom much sympathy will be felt. The memory of a good and conscientious medical man will remain long in the minds of his patients, who realize how good a friend Dr. Macleay was to them.

SURESH PRASAD SARBADHIKARI, B.A., M.D., C.I.E.,

Professor of Clinical Surgery, Carmichael Medical College, Calcutta.

DR. SURESH PRASAD SARBADHIKARI, one of the most eminent Indian surgeons, died on March 10th, 1921, in his 55th year. The son of a well known physician of Calcutta, he was educated at the Calcutta Medical College, and graduated M.B. of Calcutta University in 1888, and M.D. two years later. After serving for two years as house-surgeon at the Mayo Hospital, Calcutta, he went into private practice and quickly made a name as a surgeon, being one of the pioneers of ovariotomy in India. He was a vice-president of the first Indian Medical Congress in 1894, and was one of the Indian representatives at the International Medical Congress in London. A member of the Calcutta University Senate, he was a university examiner in surgery, and professor of clinical surgery at the Carmichael College. During the war Dr. Sarbadhikari organized the Bengal Ambulance Corps, which did good work in Mesopotamia; he was awarded the C.I.E., and was appointed an honorary lieutenant-colonel in the I.M.S. He had a large share in the establishment of Carmichael Medical College; he was a member of the British Medical Association, and did much to raise the status of Bengali medical men.

WE regret to record the sudden death of Dr. WILLIAM ADAM SMITH MICHIE on May 11th. Dr. Michie, who was 69 years of age, was born at Towie, Aberdeenshire, and received his medical education at Aberdeen University, where he graduated M.B., C.M. in 1879, and M.D. in 1885. He subsequently took the diploma of M.R.C.S.Eng. After practising for some time near Aberdeen, he acquired a large general practice in Blackheath Road, Greenwich, and remained there until 1905. Thereafter he went into practice at 15a, Gower Street, where he worked with increasing success until the day of his death. Dr. Michie was an old member of the British Medical Association. His funeral was attended by many patients and by a detachment of the Metropolitan Police, many of whom he attended and with whom he was a great favourite. He is survived by his widow and two married daughters.

Universities and Colleges.

UNIVERSITY OF CAMBRIDGE.

AT a congregation held on June 4th C. G. L. Wolf, M.D., received the degree of Ph.D., and the following medical degrees were conferred:

M.D.—C. S. Clarke, L. M. Weeks.
M.B., B.CH.—H. Barbash, L. W. Batten.
B.CH.—W. H. Marshall.

Diploma in Psychological Medicine.—The dates for the next examinations have been fixed as follows: For Part I (Anatomy and Physiology of the Nervous System and Psychology), October 11th, 12th, and 13th, 1921; for Part II (Neurology and Psychiatry), November 30th, December 1st and 2nd, 1921. A course of instruction for the Diploma will be held in Cambridge from July 18th to August 20th. Lectures and practical work will be given by Dr. Lowson (Psychology), Dr. Thacker (Anatomy and Physiology of the Nervous System), Dr. Prideaux and Dr. Myers (Psychopathology), Dr. Rivers (Psychology and Pathology of Dreams), Dr. Archdale (Mental Diseases). Those who wish to take the course are requested to send their names, if possible before July 10th, to the Secretary of the D.P.M. Committee, Psychological Laboratory, Cambridge, from whom further particulars may be obtained.

UNIVERSITY OF MANCHESTER.

THE following awards have been made:—*Tom Jones Exhibition in Anatomy:* L. J. Prosser. *Turner Medical Prize:* G. V. Ashcroft and Margaret Single.

PROFESSOR ACHARD has been elected general secretary of the Académie de Médecine.

AT Bordeaux a post-graduate course in oto-rhino-laryngology will be held, under the direction of Professor Moure, from July 18th to 30th. The fee is 150 francs, and particulars may be had from the Secretary of the Faculty of Medicine, Place de la Victoire, Bordeaux.

PROFESSOR ALBU, a well known Berlin specialist on diseases of the stomach, died recently at the age of 54.

Medical News.

H.R.H. THE DUKE OF CONNAUGHT will distribute the prizes at St. Thomas's Hospital Medical School on Tuesday, June 21st, at 3 p.m., in the Governors' Hall.

A PROVINCIAL meeting of the Section of Diseases in Children of the Royal Society of Medicine will be held at Reading on June 24th and 25th.

A SYSTEMATIC post-graduate course of instruction in diseases of the heart will be held at the National Hospital for Diseases of the Heart, Westmoreland Street, W.1, from July 11th to July 23rd. Practical instruction will be given in the use of the polygraph, electro-cardiograph and other instruments. Further information can be obtained from the secretary at the hospital.

AT the meeting of the Röntgen Society to be held at 35, Russell Square, W.C., on June 16th, at 8.15 p.m., there will be a discussion on the physics of the *x*-ray tube. All interested are invited to attend.

A DINING club, composed of all past and present members of the honorary and house staffs of the Hospital for Sick Children, Great Ormond Street, held its first dinner, under the chairmanship of Sir Thomas Barlow, on June 1st, when sixty-three members attended, including many who were house officers of the hospital as far back as 1880–1890. It is hoped to hold the next annual dinner on the first Saturday in June, 1922.

THE tournament of the Medical Golfing Society will be held at Walton Heath on Thursday, June 16th. The medical golf championship, for which the *Lancet* has presented a cup, will be played; there will be play also for the Henry Morris challenge cup and the Medical Golfing Society's medal (for the best return under handicap). The annual subscription to the Medical Golfing Society is 5s., which should be paid to the honorary secretary and treasurer, Dr. Rolf Creasy, 36, Weymouth Street, London, W.1. Entries for the competition should be sent to him not later than Tuesday, June 14th.

THE annual dinner of the Indian Medical Service will be held at the Trocadero on Wednesday, June 15th, Major-General Sir R. Havelock Charles, G.C.V.O., in the chair. Tickets and all particulars may be obtained from the joint honorary secretary, Colonel J. J. Pratt, I.M.S.(ret.), 63, Addison Road, Kensington, W.14.

DR. T. G. GARRY, M.B.E. (Cairo), has been reappointed British Physician at Pistany (Pöstyén), Czecho-Slovakia, for the summer months. Pistany has natural hot peat baths which are used for various forms of arthritis, pelvic disorders in women, and cutaneous affections. The place is an hour's journey from Pressburg, the capital of the Czecho-Slovakian Republic. The railway arrangements, it is said, are working satisfactorily.

THE subject of acid-fast bacilli in relation to the prevention and cure of tuberculosis has of late occupied much space in the German medical press. The papers advocating or condemning Friedmann's turtle vaccine have become so numerous that Professor J. Schwalbe, editor of the *Deutsche medizinische Wochenschrift*, announces that to check this deluge he will in future publish only such papers as contribute something definitely new to the subject.

DR. J. H. DOUGLAS WEBSTER, honorary radiologist to the Manchester Ear Hospital, and radiologist to the Manchester Board of Guardians, has been appointed Honorary Physician-in-Charge of the Department of Physical Medicine at the Middlesex Hospital, London.

A MEMORIAL to the medical officers, pharmacists, and members of the Belgian Army Medical Corps who lost their lives in the war was inaugurated by the Minister of National Defence in the Leopold Park, Brussels, on May 29th.

THE annual dinner of the West London Medico-Chirurgical Society was held at the Hotel Great Central on June 2nd, with the President, Dr. Frederick J. McCann, in the chair. After the loyal toasts had been honoured, Mr. Aslett Baldwin proposed "The Imperial Forces," making special mention of the great work done during the war by the medical services. In his reply, Surgeon Vice-Admiral Sir Robert Hill, Medical Director-General R.N., expressed his pleasure at being once again among West London friends. Sir Norman Moore, President of the Royal College of Physicians, in proposing prosperity to the West London Medico-Chirurgical Society, said that his recollection of Charles Keetley, with whose name the society would always be associated, was that of a delightful companion and brave man. Passing from the beginnings of science at Hammersmith in the days of Prince Rupert, Sir Norman Moore spoke of the origins and functions of the London medical societies, and the benefit that came to them and to medicine through healthy competition. The President, in responding, traced the continued success of the society to the spirit of energy and progress which had animated its officers, among whom the names of Keetley, Bidwell, and Alderton would ever be remembered with honour. The health of "Kindred Societies and Guests" was submitted by Dr. Arthur Saunders and replied to by Dr. G. de B. Turtle, and the toast of "The Chairman" was proposed in warm terms by Dr. Rickard Lloyd.

MR. NORMAN GODFREY BENNETT, M.A., M.B., L.D.S., and Mr. MONTAGUE HOPSON, L.D.S., have been appointed to act as examiners in the entrance examination for the Royal Naval Dental Service.

AT a recent meeting of the National Baby Week Council a message from Queen Mary was read by Dr. Eric Pritchard, who was in the chair. The message expressed Her Majesty's interest in the forthcoming celebration in July of the fifth anniversay of the inauguration of Baby Week, and her sincere wishes for the successful continuance of the work. At the same meeting Dr. Mabyn Read, medical officer of health for Worcester, gave some statistics regarding the reduction of the infant mortality rate in that city from 145 per 1,000 births in 1900–4 to 67 per 1,000 in 1920. Dr. Leonard Hill pointed the moral of the smokeless atmosphere of London at the present time, the result of the non-use of coal as fuel, and made a strong appeal for the proper use of coal, in order that the health of the whole community, and not least that of the children, might be benefited. Professor Edgar Collis spoke of economy in health and industrial hygiene. To obtain a healthy nation the first essential was expenditure on healthy infants. Miss Eleanor Rathbone, who pleaded for the endowment of motherhood, pointed out that poverty and privation—when the mother was child-bearing and the children were young—had a most serious permanent effect on the health of the race.

AT a meeting of the College of Physicians of Philadelphia on May 23rd, Madame Curie presented to the College an apparatus designed and used by her in her earlier research work on measuring the radio-activity of radium, and Dr. Robert Abbe of New York presented mementoes of Lister and of Pasteur in a special case for their permanent preservation.

A HANDSOME presentation was made on June 1st to Dr. J. W. Mullen, Superintendent of the Ladywell Sanatorium, Salford, to mark his completion of forty years' service as medical superintendent of the infectious diseases hospital, and also, by a coincidence, the celebration of his silver wedding. A pupil of the late Sir William Stokes, Dr. Mullen qualified in Dublin in 1877, and immediately afterwards became medical superintendent of the Dublin Small-pox Hospital in the midst of a serious epidemic of that disease. Coming to Salford he devoted his life with great success to the care of patients suffering from infectious diseases.

AN exhibition of *x*-ray photographs has just been opened at the house of the Royal Photographic Society, 35, Russell Square, W.C., under the auspices of the Röntgen Society. Comprising over 250 prints, it includes a number of notable examples from the French radiologists, which arrived by special aeroplane from Paris on the day before the exhibition opened. Of historic interest are the photographs of hands of celebrities taken in 1896 by Mr. A. Campbell Swinton. There is a series of sets of four prints produced by lay workers employed in the radiographic departments of hospitals, or as assistants to qualified radiographers, shown in competition for prizes offered by Dr. Robert Knox, President of the Röntgen Society. The exhibition will remain open daily during the whole of June, except Sundays, from 11 a.m. to 5 p.m., admission free.

THE second International Congress on the History of Medicine will be held in Paris, from July 1st to 5th, under the auspices of the Société Française d'Histoire de la Médecine, and will be presided over by Professors Jeanselme and Menetrier. The Congress will be opened by the inauguration of the new museum of medical history. The mornings will be occupied by such topics as the history of hospitals and public health work, identification of the great epidemics of history, and the food supply of man and beast in antiquity and the Middle Ages, while in the afternoons excursions will be made to various hospitals, museums, and other places of historical interest in and near Paris. Further details may be obtained from the secretary-general, Dr. Laignel-Lavastine, 12 bis, place de Laborde, 8e, Paris.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London;* telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London;* telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Mediscra, Westrand, London;* telephone, 2630, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin:* telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate Edinburgh;* telephone, 4361, Central).

QUERIES AND ANSWERS.

"P. C. G." wishes to ascertain the value, if any, of a work on surgery, in Latin, by Iohannes Tagantius, printed at Leyden in 1560, and illustrated with woodcuts.

"WORRIED" writes: Can any of your readers kindly advise me as to the treatment of a case of *Oxyuris vermicularis* of three years' duration. Injections of salt and infusion of quassia by means of a long tube have been repeatedly and continuously tried without success.

"M.," as the result of a strain of the right knee some years ago, is now liable, on any slight injury, to suffer aching under the patellar ligament. There is no evidence of rheumatism or known focus of infection. He asks whether it is due to a bursitis or to a "nipping" of the fat and synovial membrane under the ligament, and what is the best treatment?

INCOME TAX.

"C. P." inquires as to liability—if any—in respect of interest accruing in India, but not remitted to this country, on stocks belonging to his wife.

*** If neither "C. P." nor his wife are ordinarily resident in this country the basis of liability is the amount remitted in the year of assessment; in the alternative liability attaches to the income accruing, whether it is remitted to this country or not. The rate payable is the full, or investment, rate.

"MEDICAL MISSIONARY" states that he receives as a foreign missionary "£260 a year tax free." In making a statement for the purpose of reclaiming a portion of the tax suffered on his private income, he asks how he should calculate the gross income.

*** If the Missionary Society is specifically accounting for tax to the British income tax authorities on the stipend the amount to be added to the £260 is the sum paid to the authorities by the society. If, however, our correspondent means that the stipend is "tax free" in the sense that it is exempt from assessment to tax in this country—which seems to be the correct position—he should enter the income as "£260 not liable to taxation."

LETTERS, NOTES, ETC.

DIAPHRAGMATIC HERNIA.

DR. HUGH A. DAVIS, of Wimbledon, writes to say that he was recently called to make a necropsy on a newborn infant. The abdominal cavity contained only the liver, left kidney, bladder, and about one and a half inches of the lower bowel. The other abdominal organs were in the thorax tightly packed against the lungs, which were solid. The opening in the diaphragm was about one and a half inches in diameter.

PSYCHIC PHENOMENA.

DR. J. SCOTT BATTAMS (London, N.W.) writes: In your brief notice of Dr. Crawford's book, *The Psychic Structures of the Goligher Circle*, your reviewer suggests three possible attitudes that may be assumed in regard to this field of inquiry, choosing for himself the most common, and perhaps the least desirable—namely, the sceptical attitude, with a strong bias towards explaining various phenomena as due to illusion of the senses, as in conjuring tricks. In this attitude of mind many who are now spiritualists began to investigate. It accounts probably for the conclusions reached by those who, without even such first-hand experience, ignore or belittle the remarkable investigations of Dr. Crawford and Dr. Geley. Your reviewer advocates investigation "even of spiritualistic phenomena," but kicks at the precautions and conditions demanded by mediums. But in this obscure field of research the methods of science may suffice, but its most delicate instruments are often useless, and it is impossible to lay down hard and fast conditions. They must be discovered by prolonged investigation and repeated experiment; and the true scientist will not ignore the precautions and conditions adopted by other explorers as the result of experience. To those of us who lack such first-hand experience the question of *attitude* becomes the more important. I express no opinion as to how far a materialistic science is compatible with any idealistic philosophy or spiritual religion, but it may safely be suggested that scientific men should approach the investigation of "so-called psychic phenomena" with the open mind, remembering that we have not reached that summit where there is no more to learn, but are all evolving. Orthodox psychology knows little of the "make-up" of the medium, and, though it has greatly enlarged our conception of the subconscious, yet to many it is a lumber-room and to others, apparently, a cesspool. Nor should we forget the chastening fact that at every advance in knowledge some of our most cherished theories and dogmas pass into oblivion.

*** Our Reviewer writes: To Dr. Scott Battams's "attitude" towards other explorers no one need take exception; but his admission that the most delicate instruments of science are often useless in this field of research gives the reason why investigators should refrain from advancing hypothesis of pseudopods and mysterious emanations from the medium. Nearly all writers on the subject of mediums have admitted that the practice of deception has at times been detected. Surely such deception resembles an attempt at producing the illusions of the conjurer, who also demands "precautions and conditions." Therefore any research into the origin of the phenomena demands the attitude of mind adopted with regard to the manipulations of the conjurer, and such words as "materialization" and "pseudopods" should be eliminated from the discussion, unless, indeed, the direct attack has been made on the manifestations by seizing a pseudopod and subjecting it to examination. The allegation that such treatment might seriously damage the medium is given as a reason for imposing some of the conditions. We believe, however, that attempts made in this direction have had no disastrous effects. So long as such crucial tests are not made, the investigator should studiously refrain from suggesting explanations of the phenomena—or illusions—which he describes.

"THE BUFF BOOK."

DR. H. J. VAN PRAAGH (Hampstead, N.W.3) writes: I shall be obliged if you will kindly note that my name appears in "The Buff Book" without my knowledge or consent, and I have written to inform the publishers of their error. I have no idea how it got there, and quite agree with you that it is an unprofessional insertion.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 25, 26, 27, 30, 31, and 32 of our advertisement columns, and advertisements as to partnerships, assistantships, and locum tenencies at pages 28, 29, and 30.

MESSRS. R. AND J. BECK, Ltd. (68, Cornhill, E.C.3), have issued a catalogue describing, with illustrations, special types of the Standard London Microscope. Copies may be obtained on application.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Six lines and under	0	9	0
Each additional line...	0	1	6
Whole single column (three columns to page)	7	10	0
Half single column	3	15	0
Half page	10	0	0
Whole page	20	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Tuesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.